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PHYSIOLOGY FOR THE PUBLIC

OPINIONS OF THE PRESS.

The second number of "Dr. Hayden's Lectures on Popular Physiology" is rife with valuable and interesting matter, which must prove infinitely beneficial if widely circulated. One peculiar feature which this work possesses, and which is calculated to make its usefulness general, is the simplicity of the details and examples afforded. In most medical books the technical terms are so numerous that the non-professional readers are often unable to ascertain the author's meaning. In Dr. HAYDEN'S admirable lectures every thing is clearly and agreeably narrated, and the plain, lucid, and unaffected style of the learned lecturer renders his labours really useful to all classes of the community. We cordially recommend his lectures to the public.—*Evening Packet*.

He handles his subject in a familiar manner, making it comprehensible to all; it is divested of those technicalities with which such writings are usually encumbered, while it enters deeply enough into the science to make the reader feel that he has not lost his time in the perusal, but that he has added to his fund of knowledge such matter as will often, in his leisure moments, afford him subjects of interesting speculation.—*Leicester Herald*.

To the able lecturer and author we wish every encouragement, and hope he will be well rewarded for the pains he has taken to enlighten the public mind in a species of knowledge in which every individual is personally, we might say, vitally concerned, &c.—*London Medico-Chirurgical Review*, January, 1842.

The third number of this interesting and eminently-useful work is fully equal in manner and matter to its predecessors, and as they have won the approval of the press generally, we need add little more to recommend the publication to our readers. Heads of families and conductors of public schools, where there are numerous boarders and no resident physicians, could not possess a better guide for the preservation of the health of those intrusted to their charge; and we are pleased to find that a rapidly-extending circulation is affording the best proof of the correctness of our former criticisms.—*Evening Packet*.

PHYSIOLOGY FOR THE PUBLIC, No. 4.—The number before us is highly amusing and instructive. It enters fully into the consideration of moral influences on the bodily functions, and will well repay perusal.—*Warder*.

. The knowledge of this fact should insure it a very wide circulation among the reading public of all tastes and classes, who will find it as interesting as a fairy tale, for Dr. Hayden appears to possess, in a pre-eminent degree, the same faculty as our countryman Goldsmith—namely, giving to a dry subject the interest of romance.—*Londonderry Sentinel*.

The design of this work is to give information on the principles of human nature with reference to the preservation of health, and to do so in language intelligible to the people—a design which claims the approbation of every well wisher of mankind. That such general ignorance should prevail on a subject so vital as physiology, has been among the worst defects of modern education. To remedy this defect is the object of Dr. Hayden. We shall watch the progress of the work with interest, and wish it all the success it deserves.—*Morning Press*.

* * See also *Medical Press*, *Warder*, *Freeman's Journal*, *General Advertiser*, *Londonderry Sentinel*, *Old England*, *Conservative Journal*, *Dover Telegraph*, *Leicester Herald*, *Medical Record*, *British Queen*, *National Advertiser*, *Era*, &c. &c., for extracts, opinions, and recommendations of this work.

PART II.

Will consist of Six Monthly Numbers. The first will be published November, 1842. The whole work will be comprised in 12 Numbers, any one of which may be had separately.

OPINIONS OF THE PRESS.

We have just received the second number of Mr. Hayden's interesting work upon this subject. As we promised to investigate each part as it proceeds monthly from the press, we will, on the present occasion, redeem that promise. The author states, *in limine*, that this work is not written with a view to making every man his own doctor; and he observes—"It was truly said, that even 'the physician who prescribes for himself had a fool for his patient.' It is therefore with reference to the *prevention*, not the remedy of disease, that popular physiology should be perused by the public."

Indeed, we must admit that hitherto writers upon the subject of popular physiology have not been successful in diffusing knowledge in this department amongst general readers. Our author assigns the following as the causes of their want of success:—

Firstly.—It is to be regretted that hitherto even popular works on physiology, have been much encumbered with anatomical details, which have rendered them a study instead of a species of relaxation. The public will never be made either comparative or human anatomists; they will prize and admire the gold and gems that you shall have raised for their use and gratification, but you cannot persuade them to become miners, although you should hold out the pleasing prospect of the possession of such treasures as the reward of their own labour.

Anatomy then,

"Does but encumber what it means to enrich;"

and hence popular physiology, thus burdened, is often considered by the general reader as dull and difficult to be understood.

The object, we presume, should be to present the public with the results of professional labours and researches, without inflicting upon them, what proves not unfrequently dry and difficult-to-be-remembered, anatomical descriptions. We all wish to see the panorama, but few of us would care to study the details of the machinery by which motion is given to the pleasing prospect.

Secondly:—We are of opinion that it is sufficient to state in such works those plain facts only, which are generally received by physiologists, avoiding as much as possible unexplained technical terms and the consideration of subjects either involved in obscurity, or still the objects of doubt or of discussion.

We would recommend such of our readers as love a hearty laugh to read the humorous account given by the facetious doctor of the "Vagaries," as he calls them, of authors that have written upon the discovery of the vital principle — *Warder*.

If we can judge of the forthcoming work by the numbers now before us, we should say it will prove a useful addition to our popular literature. In asserting a physiological doctrine, Dr. Hayden invariably illustrates it by some anecdote at once amusing and instructive, thus conveying information in the most pleasing form, and that most calculated to leave an impression on the reader. It is hardly necessary to add, that we strongly recommend the perusal of "Physiology for the Public" to such of our readers as are not content to remain behind their age, in the knowledge of those physical sciences which are calculated to fit them for that better and more rational enjoyment, which an acquaintance with the laws that regulate our functional existence would point out.—*Freeman's Journal*.

Through the medium of the press, indeed, several valuable suggestions on this, as well as every other subject, have in modern times found their way to the public, and these have not been without their good effect; but the information thus communicated has consisted only of a few general rules for the preservation of the corporeal and mental faculties in a healthy state—there has been no attempt that we are aware of to treat the subject fully and systematically, or to free it from those technicalities which make it a sealed book to the vast majority of readers. The work of Surgeon Hayden seems likely to go far towards filling up this desideratum, and to prove what its author designs it to be, "a truly popular treatise upon the physiology of man."

The style is of that simple and familiar kind which at once wins the attention and adapts itself to the capacity of every reader. Let it not be supposed that we wish every man to become his own doctor. Far from it—we agree with the writer of this treatise in thinking that physiology

PHYSIOLOGY FOR THE PUBLIC;

COMPRISING
PLAIN PRINCIPLES AND RULES

FOR THE PRESERVATION OF
THE FUNCTIONS OF BOTH BODY AND MIND
IN A

STATE OF HEALTH.

"Præterea, ne, sic, ut qui jocularia, ridens
Percurram (quanquam ridentem dicere verum
Quid vetat? ut pueris olim dant crustula blandi
Doctores, elementa velint ut discere prima.)"

"But not to treat my subject as in jest,
(Yet may not truth in laughing guise be drest,
As masters fondly soothe their boys to read
With cakes and sweetmeats?) let us now proceed."
HORACE, Sat. I.

IN A SERIES OF LECTURES.

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1842.



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The issue of the six Monthly Numbers which will constitute the Second Part will commence November, 1842.

LECTURES

ON

POPULAR PHYSIOLOGY.

INTRODUCTION.

We purpose, in the following Lectures, to present the general reader with a truly popular treatise upon the physiology of man, in reference both to his corporeal and mental functions.

This subject—how man lives, moves, and has his being, should naturally excite universal as well as particular interest; more especially in the present age, remarkable alike for the march of mind, and the facilities afforded of diffusing knowledge amongst all classes of the people.

It has been justly observed, that the perusal of popular publications on the practice of medicine is calculated to mislead, instead of instruct, nay, often to induce a hypochondriacal condition. We are fully convinced that such works are unsuitable for the public; for they are read with a view to *curing* disease. It was truly said, that even “the physician who prescribed for himself had a fool for his patient.” It is therefore with reference to the *prevention*, not the remedy of disease, that popular physiology should be perused by the public. In this respect, we esteem such works as constituting an indispensable portion of a sound

and liberal system of education, contributing as they do, in a pre-eminent point of view, to establish plain principles and intelligible rules in support of nature's first and most imperative law, self-preservation. Our experience with respect to people in general is, that in reference to the art of preserving health, and co-operating with the physician for its restoration, they are pretty nearly in the same position as uninformed children, who are continually the victims of what we call little accidents; or of the noble of Otaheite whom Captain Cook treated with tea, and who, having caught the boiling water in his hand, bellowed with pain, not conceiving that water could become hot like fire. How can it be otherwise as regards the public in general? for we do not become acquainted with the science of life by intuition; nor should we suppose that an individual could travel through a strange country with safety and precision, without the aid of a map or the instruction of a guide!

An excellent writer, when recommending the perusal of popular physiology, observes:—"It would likewise lay the foundation for the attainment of a more just, accurate, and practical knowledge of our intellectual and moral nature. There is a physiology of the mind as well as of the body: both are so intimately united, that neither can be well understood without the aid of the other; and the physiology of man comprehends both. Were even what is already known of this science, and what might be easily communicated, made a part of general education, how many evils would be avoided, how much light would be let in upon the understanding, and how many aids would be afforded to the acquisition of a sound body and vigorous mind? pre-requisites more important than are commonly supposed to the attainment of wisdom and the practice of virtue."

The value of an acquaintance with the principles of physiology, in reference to everyday concerns, may be still further indicated by referring to familiar circumstances. How many cases of disease, nay, even of death, have occurred owing to tight lacing? Now, had it been shown to parents and children that such practices were positively injurious, before the continuance of the custom had fastened it upon them as a habit, we should not have had our young ladies cheated of their fair and natural proportions, nor robbed of that grace and beauty which is the birthright of their unimprisoned figures. It should, at the outset, have been clearly proved—which we shall do in the proper place—that elasticity is so much and constantly employed in the animal economy, but more especially in the vital functions of respiration and circulation. This being done, the necessity for the perfect freedom of the person would be a self-evident truth. Occasions will necessarily arise in which, in the absence of a medical practitioner, ordinary persons will be called on to attempt some remedy for urgent symptoms of disease. Nothing but a knowledge of the *principles* of popular physiology, can possibly save them in such cases from the charge and reproach of mere QUACKERY, or impart to a parent or clergyman that decision and confidence so requisite on sudden emergencies.

We may here cite as a curious circumstance the fact,—that all the *direct* efforts that have ever been made to suppress quackery have but increased its growth. The world has always manifested, from the earliest ages, a propensity to this weakness. Dr. Paris states, “that the sacred impostor described in the Alexander of Lucian, who established himself in the deserted temple of Esculapius, entrapped in his snares some of the most eminent of the Roman senators.”

He adds: "It is true, that in medical quackery, as in every other species of fraud, the knave may accomplish his object with greater or less effrontery. The quackery of the present day is perhaps characterised by an artful plausibility, by an insidious appearance of candour; for, although we may perchance meet with a remorseless ruffian, who smiles over his blood-stained victim, the majority of empirics, like Gibbet in the "*Beaux Stratagem*," pique themselves on being the best behaved men *on the road*, and on conducting themselves with mercy in their vocation. "Credulity," he justly states, "is a far greater source of error than superstition; for the latter must be always more limited in its influence, and can exist only, to any considerable extent, in the most ignorant portion of society: whereas, the former diffuses itself through the minds of all classes, by which the rank and dignity of science are degraded, its valuable labours confounded with the vain pretensions of empiricism, and ignorance is enabled to claim for itself the right of delivering oracles, amidst all the triumphs of truth and the progress of philosophy."

Let us examine what this credulity is. According to Dr. Paris' definition, it is "an unbounded belief in what is *possible*, although destitute of proof, and perhaps of probability." Now we would say, the most effectual, and, indeed, the only mode of dispelling darkness is by diffusing light: in like manner, the most rational way of suppressing quackery is to demonstrate, by the principles of physiology—the truths, the axioms of the science—that what the empiric trumpets forth as certain, infallible, is in most instances *impossible*, and always improbable. Credulity, as we have said, is one of the besetting sins of our nature. It is by no means confined to the illiterate; for we read that the "*most eminent Roman senators*," and perhaps we might add, some

of the English ones even of the present day, were entrapped by the empiric. We hold that this is very natural; for clever statesmen may be, and often are, utterly ignorant of the principles of that science which, if known, would enable them to reduce to the *argumentum ad absurdum* the assertions of the quack; and also direct them, in their senatorial capacity, to adopt rational plans for the preservation of health, the prolongation of life, the consequent diffusion of enjoyment, and of the most important branch of practical knowledge.

“ Ignorance is the curse of God,
Knowledge the wing wherewith we fly to Heav’n.”

It has been said, “a little learning is a dangerous thing;” we would observe, ignorance is still more so. Let us not be understood as advocating the notion that people in general should be *learned* upon these subjects. No: we want them to possess *accurate* knowledge, so far as it extends, of plain, practical principles and rules. It is not the quantity, but the quality of such information that we would teach them to prize. We will take a watch as an example, to illustrate our meaning. “Let us reckon up (in the language of Paley) “a few of the plainest of these parts, and of their offices, all tending to one result. We see a cylindrical box, containing a coiled, elastic spring, which, by its endeavour to relax itself, turns round the box. We next observe, a flexible chain (artificially wrought for the sake of flexure) communicating the action of the spring from the box to the fusee. We then find a series of wheels, the teeth of which catch in, and apply to each other, conducting the motion from the fusee to the balance, and from the balance to the pointer; and, at the same time, by the size and shape of those wheels, so regulating

that motion as to terminate in causing an index, by an equable and measured progression, to pass over a given space in a given time. We take notice that the wheels are made of brass, in order to keep them from rust; the springs of steel, no other metal being so elastic; that over the face of the watch there is placed a glass, a material employed in no other part of the work, but in the room of which, if there had been any other than a transparent substance, the hour could not be seen without opening the case."

Now, let us inquire, should the possession of so much knowledge, or total ignorance of its parts and uses, induce and enable us to take better care of the watch? The reply is obviously in favour of the former. With so much knowledge, the watchmaker admits that we may care and regulate, in ordinary, this beautiful piece of mechanism, so typical of the animal machine. But would it be rational, with such limited knowledge, either to attempt to repair the watch ourselves, or submit it for that purpose to the hands of the unskilful pretender? No: it would be an obvious outrage on common sense to do so. Yet it is an every day act to put ourselves, "fearfully and wonderfully made" as we are, into the hands of half-educated practitioners, and ignorant, unscrupulous quacks.

When in the enjoyment of health, we are prone to undervalue and neglect the prevention of disease. It is the suspension of this first of earthly blessings that induces us to look back, and reflect with regret upon our reckless inattention to so important a subject.

Two causes appear chiefly to have operated in limiting the extension of physiological knowledge amongst general readers.

Firstly:—It is to be regretted that hitherto even popular works on physiology, have been much encumbered with

anatomical details, which have rendered them a study instead of a species of relaxation. The public will never be made either comparative or human anatomists: they will prize and admire the gold and gems that you shall have raised for their use and gratification, but you cannot persuade them to become miners, although you should hold out the pleasing prospect of the possession of such treasures as the reward of their own labour.

Anatomy, then,

“Does but encumber what it means to enrich;”

and hence popular physiology, thus burdened, is often considered by the general reader as dull and difficult to be understood.

The object, we presume, should be to present the public with the results of professional labours and researches, without inflicting upon them what proves not unfrequently dry and difficult-to-be-remembered anatomical descriptions. We all wish to see the panorama, but few of us would care to study the details of the machinery by which motion is given to the pleasing prospect.

Secondly:—We are of opinion that it is sufficient to state in such works those plain facts only, which are generally received by physiologists, avoiding as much as possible unexplained technical terms and the consideration of subjects either involved in obscurity, or still the objects of doubt or of discussion.

Several works upon the subject of physiology have been consulted, in order to make suitable selections from the general store: we shall, it is hoped, be excused for not referring on all occasions to these valuable sources of information. This we have deemed uncalled for, as the facts to be adduced in the lectures have long since become the fa-

miliar and appropriated truths of the science ; and, besides, we are of opinion that frequent references tend to distract the attention of the reader, and but too frequently indicate rather more of the industry than of the wisdom of a writer.

In conclusion, we would beg to say that there are two extremes, into either of which the lecturer on popular physiology is prone to run, from pre-supposing either too much, or too little information on the part of those he addresses. We feel that we are perhaps obnoxious to the latter error, but we also deem it the safer side, as we write for the people.

Again—we would at the outset deprecate the criticism of the learned, by stating, that we write not for them, but for the information of the tyro and non-professional. We also have eschewed any claim to the dignity and gravity which proverbially belong to our profession by adopting a familiar, and what some of our friends may call, too light a style. Indeed, it is the fault of our temperament ; for we have always elung with fond fidelity to the “*utile dulce*,” and loved to learn and laugh to the end of the chapter.

We have been induced to publish the following lectures at the request of the pupils to whom they were delivered, as introductory to a course on anatomy and physiology in the original School of Medicine, Peter-street. They were then illustrated by drawings, tables, and preparations which are generally more required for an auditory than for general readers.

HARCOURT-STREET, Dublin, }
November, 1841. }

LECTURE I.

ALL objects in nature have been divided into two great classes, namely, inorganic and organic, or inanimate and animate; thus happily indicating, by the names employed, the absence or the presence of organization and life—attributes essentially distinctive of the two grand divisions of the material world.

Linæus has given us pithy and admirable definitions of the kingdoms of nature thus:—"Minerals (inorganic bodies) grow; vegetables grow and live; animals grow, live, and have feeling."

The science which treats of inorganic bodies is called natural philosophy. Investigations connected with this subject, although most interesting, and calculated to shed a no less useful than brilliant light upon physiology, yet still, as a mere outline of some of its departments would occupy such a considerable time, we shall take leave of inanimate bodies with a passing request that you will, if not already informed upon this subject, devote some of your leisure time to the acquisition of information respecting the phenomena of the inorganic kingdom.

We shall next beg to direct your attention to the consideration of some of the leading attributes of the two great divisions of the organic world, namely, animals and vegetables. Since both possess a common principle—life, from which their leading properties flow, we should naturally proceed, first, to investigate the essence and nature of this important agent.

At the outset, we beg you will bear in recollection that when life, or living principle, or vital agent, is spoken of,

we merely mean a state of being with which certain well-known phenomena are always associated, as the results of this mysterious agent acting upon and through our organization.

It has pleased the Giver of all good gifts to place man in utter ignorance of its essence ; for, with all the accumulated learning and researches of past ages and present times, we have still to discover how man lives, moves, and has his being : and, although the phenomena of life are constantly before us, yet still we know not the nature of the vital principle save from its manifestations. We shall not waste your valuable time by entering into detailed accounts of the various theories, speculations, and phantacies that have been adduced from time to time to account for the origin of the phenomena distinctive of living beings. Had speculative philosophers been content to rest quietly, as Locke quaintly says, “at the end of their tether,” and declined undertaking the investigation of matters so far beyond their comprehension, the reading world would have been spared a sore infliction ; and the objects of philosophy might have been materially forwarded, by the expenditure of that labour and that research upon attainable objects, which had been prodigally wasted upon incomprehensible, and, consequently, profitless inquiries.

Let us not be understood as decriing true philosophy, that which proceeds upon acknowledged data, derived from observation and experiment, the solid basis upon which Bacon and Newton erected the imperishable monuments of their fame and of their usefulness. Let us never lose sight of their right and rigid rules of philosophy. Let theory and experiment be as synthesis and analysis ; the one tested by the other, and both reciprocally suggesting

the materials for working out more valuable discoveries, and the unerring principles of an inductive science.

Life, like its great Author, fills all regions—earth, air, and water. “Professor Ehrenberg has discovered animalcules so minute that he computes each cubic line, which is nearly the bulk of a single drop, contains 500,000,000 of those monads, a number which almost equals all the human race.”

Now, when we conceive that life exists in each of these animals as certainly as in the largest, we are at once struck with the hopelessness of the search after that ethereal essence which, in one extreme, inhabits a microscopic animalcule, and in the other pervades the vast fabric of the huge whale or ponderous elephant. Still, it will be sought after, like the insane pursuit of perpetual motion

.....“The bubble on the stream,
That, in the act of seizing, shrinks to nought.”

We will afford you an admirable and humorous illustration of the vagaries of writers upon this subject, by quoting from Dr. Johnson’s Med. Ch. Journal for April 1839, in which he reviews a work on the physiology of man, consisting of 566 mortal pages, in octavo, and published by a “great unknown.”

The witty reviewer opens with the following:—“The present century will certainly be distinguished in the annals of the human mind. Every science and every art have re-received in it an impulsion, which is rapidly hurrying it forward: the elements of political and social life have been analyzed, and are in process of recombination; and, finally, the vital principle, the grand secret, is discovered.

“Genius is proverbially modest. If a man invents a new tooth-powder, nay, if he gives only a new designation

to an old one, he sets his name to the thing forthwith, and affects to consider immortality certain; but the discoverer of the vital principle is nameless. We see him not in the title-page, we seek him in vain in the preface, and we abandon in despair the search for his whereabouts. The discovery, however, will itself be a reward more substantial and more glorious than the beggarly fame that waits on the breath of the million—a fame that is prostituted for the panders to their pleasures or the destroyers of their kind.”

The unknown author, in reference to a knowledge of the vital principle, speaks thus in his preface:—

“The period, however, has arrived in which the truth must be developed. Real knowledge always progresses with necessity, and the elucidation of the vital principle has now become essential to the wants of mankind; for while we continue unacquainted with the origin of life, what effectual step can be taken to prevent the incursions of disease and death, so unusually prevalent in the present day? On the explanation of the vital phenomena, and general diffusion of physiological knowledge, will be found to depend the preservation of the entire human species.”

The reviewer adds:

“If this does not awaken attention, we know not what will rouse people. We have been sleeping on a volcano. How grateful we should be to the gentleman before us. Would that we could call him by his name.”

“Perhaps there are few terms more used in medicine than ‘vital principle,’ ‘vital action,’ ‘vital laws.’ If there is a difficulty, they give us the solution; if a thing is incomprehensible, the laws of vitality explain it. The vital principle is like Cerberus, ‘three gentlemen at once,’ and does all sorts of work for all sorts of people.”

We regret that our limits prevent us from extracting the admirable digest given by Dr. Johnson of the theories of life by Hunter, Lawrence, Tiedemann, Treviranus, and the modern German school; but his critique of the work of { the “great unknown” is so truly Irish, that we cannot resist our desire that such an excellent specimen of home manufacture, should be presented to you after his own fashion.

Well, let us hear our illustrious countryman on *the Discovery of the Vital Principle*. “If we have hitherto advanced with difficulty, uncertain where to tread, and scarcely able to distinguish truth from error, our hesitation will speedily be exchanged for confidence—our difficulties and doubts for the fulness of belief—our painful search for truth for the possession of her. The discoverer of the vital principle is before us, and that discovery, the monument of his genius or his fortune, is in actual print. The subtle essence, that escaped the observation of Harvey, Haller, or Hunter, has been happily distinguished and boldly grasped by the “*οὐδείς*” of the present page, and the nineteenth century has the honour of witnessing the publication of a secret to which others are not fit to hold a candle.”

The “unknown” author states, that “all known matter was contained in an ovum (egg) originally formed.” Upon which Dr. Johnson observes :—“Who would have dreamt that the universe was once an ovum? Who, if he had not been told that the present is the foetal state of matter, would have perceived that wonderful truth? Who would have guessed that the future was ‘a locomotive being?’ And yet, a little consideration might have hinted it; for the future means what is to come, and coming implies locomotion.”

“ The solid form of matter, the ovum of the universe, is (are you listening?) the diamond !”

The author now explains :

“ The diamond is, in my opinion, the identical primitive matter so correctly defined by the poet and philosopher I have just quoted. At first view, it may appear a strange and bold assertion ; but I expect to prove, beyond a possibility of doubt, that from this material the universe, containing such an immense number and variety of bodies, was really organised. According to Pliny, ‘ the superior rigidity of the diamond renders it proof against almost every species of blow ; insomuch, that if beaten on an anvil, the iron itself, both of the anvii and of the hammer, will yield before the diamond.’ ”

The reviewer adds :

“ Thus we are all formed from diamonds. It has often been remarked, that the germs of discovery have appeared among the vulgar. The Irish, that ingenious people, who notoriously have diamonds of their own,* naturally obtained a clew to the truth, and have infused their knowledge into their popular expressions. The force of ‘ Och, my *jewel*, be aisy,’ must be *now* apparent. The ovum, then, was a diamond—it sprang into a foetus.”

But we must skip, or our lecture space will be exhausted by the labours of the “ great unknown” and his admiring commentator. Dr. Johnson adds :

“ We have said enough to introduce our readers to the vital principle. They will not probably anticipate it, but we are sure they will anticipate something racy. What do they think of *dew* being the vital principle ?”

It would not be fair to abridge our author’s explanation

* “ Irish diamonds,” unreasonably depreciated.

of this *new* fact. He says :—" Dew, which is quietly descending to us to cool the vapour of the globe, has not yet been sufficiently investigated. There are some seasons of the year during which life would be insupportable without these most refreshing heavenly drops. It is well known how much dew contributes to the growth of plants. Who has not noticed that during the greatest heat of summer, when dew falls most abundantly, and rain frequently descends in torrents, that not only is vegetation most rapid in its growth, but animals and worms of various kinds, and insects of every description, are generated. *Dew* or *rain*, however, has never yet been considered the primary cause of animal and vegetable organization. From what I can collect from Dr. Wells and other authors, I feel convinced that dew does not belong to our globe, the earth, but that it comes directly from the sun to us, and is always accompanied in its descent with black specks, similar in appearance to soot or flakes of charcoal : these black flakes and specks, during the severity of our winter, become, with the dew and rain, crystallized, and fall to our earth as snow. Thus it will be seen that dew, when deposited upon our earth, is not a simple, but a triple substance, viz. carbon, hydrogen, and oxygen. Who has not experienced the unpleasant sensation caused by snow after it has lain on the ground for a day or two ? It no longer retains that beautiful and primitive whiteness which it had on its first descent to the earth : on the contrary, it becomes dirty, and spotted, dark, cold, and comfortless, and uneven on its surface. This aspect of snow is not confined to towns or their vicinity, where it might be conjectured to arise from smoke and dust descending from our atmosphere. No ; snow presents the same appearance on barren heaths on mountain tops, or the wildest plains."

Now hear the reviewer :

“Dew,* then, plays first fiddle in the scheme of nature. How it becomes the vital principle is not, at first sight, clear; but, perhaps, the following considerations may enlighten us.”

We can transcribe but a little bit of the author's precious prose—in which we must admit, he is prone to poetic flights. He says :—“When, however, these three materials (oxygen, hydrogen, and carbon) come in close contact by surrounding pressure on the atmosphere, the electric spark on liquid flame escapes, and locomotive animal life is generated.”

Dr. Johnson expresses his admiration of the explanation of the author, (a scrap only of which we have given,) in the following almost idolatrous praise :—“It would be superfluous to argue upon this: the vital principle is discovered. We may shout, like Xenophon's companions, “*θαλατσα θαλατσα!*” Dew is at the bottom of it. Just conceive the simplicity, demonstrability of the theory. Theory do we call it—the truth—the axiom. People have been sleeping for forty centuries in the open air, and never found out that dew, and nothing but dew, is the vital principle.” “Dew comes from the sun—the sun is a diamond—we are bits of diamonds, ‘chips of the old block;’ of course, dew is the vital principle. The wonder is, not that dew is life, but that we never found it out. Hail, nameless author! greater than Harvey, why wilt thou hide thy name?” Again :—“It would be useless to comment on these sublimities. As they pass the limit of ordinary understandings, and rise superior to the forms and substance of mere reasoning, the only thing left is to fall

* This sufficiently explains the popularity of “mountain dew.”

prostrate and adore in the Mussulman fashion: ‘Alla il alla!’ there is but one vital principle, and the ‘great unknown’ is its prophet.” We cannot find space for the sketch of the foetal circulation given by this “huge philosopher;” the reviewer thus apostrophizes it:—“For scientific truth, dramatic interest, simple grandeur, and domestic pathos, *this* foetal circulation seems unequalled.”

But, as we are drawing to the conclusion of this *precious* book on the vital principle, we are astounded with the discovery that “the worms they creep out, and the worms they creep in,” during life as well as after death. “It might be reasonably supposed,” adds the reviewer, “that man, being made of diamond, was likely to last. But there is one disturbing circumstance which our readers have not taken into the account—he is a great worm manufacturer.”

Hear the description in the author’s own words: “Man, indeed, is (and I feel assured the theory cannot be denied) formed of a complete tissue of worms. From the very centre of the system unto the surface, his whole body is nothing but a continuation of worms, all linked together to form one tree or rock, rising up perpendicularly to the earth’s surface.”

Our reviewer most happily observes:—“The worms themselves are made of diamond too, and there could not be a more happy illustration of the branch of art, popularly denominated, ‘diamond cut diamond,’ than this.”—“The plot naturally thickens as we approach the termination of the volume. It seems that man, by the increase of his mechanical power, has formed new plans, quite contradictory and inferior to the mighty plan of nature—an error which has been creeping on ever since the flood, and has now become one frightful vice: our situation is, therefore, very

critical. The whole race of human beings is on the very brink of being turned again into diamonds, and a strenuous effort is necessary on the part of each individual. We must make ‘a long pull, a strong pull, and a pull all together.’ The remedy is obvious. Diffuse a knowledge of the vital principle: make every man his own physiologist and doctor.”

Listen to the soul-stirring appeal of our renowned { author, who rises with the occasion:—“Away, then,” he says, “with every imaginary distinction of birth, of employment, or of country! We all are of one family, descended from one parent; our common country, the whole habitable globe; our *employment*, the one end and aim of perpetuating and *improving the human species*! Medical information must be extended without reserve to every branch of the community, in order that each individual, by the preservation of his own health, may contribute his share towards purifying the atmosphere.”

Upon this subject, Dr. Johnson says: “Can anything be more easy than that? We have been exhaling carbonic acid for sixty centuries: let every man be his own doctor, and exhale nothing but oxygen.”

We suppose that Mr. Frantz, in the play of “Money,” has looked into the work of our immortal author, as the employments of both appear to be identical, viz.: “the one end and aim of *improving the human species*.” We will allow Mr. Frantz to speak for himself in his own Franco-Saxon dialect:

“But de tailor, de Schneider, *make* de gentleman! It is Mr. Frantz of St. James’s who take his measure and his cloth, and who make the fine handsome noblemen and gentry, where de faders and de mutters make only de ugly little naked boys!”

Need we contrast the claims of these rival philosophers? Their respective merits are indeed made manifest!—

“Utrum horum mavis,—accipe.”

Dr. Johnson resumes, and adds:—“As subordinate items of this glorious plan, we must warn our readers to prepare for emigration on a large scale. The ‘unknown’ invokes them in this inspiring address:—‘Make ready to set sail to the east—to the west—to the north—to the south! A discovery more brilliant than that of Columbus awaits you! A new, an unexplored region is about to be revealed—a country already the abode of your fathers, your mothers, your sisters, your lovers, and your friends!’

The reviewer obligingly informs us, that, “for those who live inland, and cannot set sail directly from home, this man of wonders has a remedy: it is to construct Nassau balloons.”

Do but listen to the proof he affords that his imagination can be surpassed only, by his inventive genius:—“The human mind,” he adds, “by this time will comprehend, from the perusal of the preceding pages, how a remnant of the virtuous portion of mankind may be saved alive in the last day, by the very powerful invention of balloons. Ere the awful termination of the present abode of man, let us hope we may see the surrounding atmosphere spotted and illumined by moving vessels of every description, as we now behold them on the waters. Here, then, is excitement for genius and talent to unite in every possible way: not a moment should be lost in devising the means of preservation from the impending danger.”

Dr. Johnson closes the book of the “great unknown” with the following observations:—“We are exhausted with the grandeur of these pages. We have done our

duty. The readers of the *Medico-Chirurgical Review*, at least, will be saved, and all we ask is to order their booksellers in the new world to continue to take *us* in. Surely this is moderate and modest. An ordinary person might suppose that the discoverer of the vital principle had either just escaped from a keeper, or was in immediate want of one—a base reward for a man who has shown us that our real composition is malic acid and diamond, and has told us of a certain method of cheating death and the devil.”

It has been justly observed, that ridicule is a much more powerful weapon than argument. It would have been utterly impossible to present you with a more preposterous specimen than the one before us affords, of the wilds and labyrinths into which an individual *called* a rational animal strays, when he substitutes his own imaginings for the results of rigid inductive inquiry. We shall, in taking leave of the work of the “great unknown,” and his talented and humorous reviewer, recommend you to learn always the useful lesson, that the errors of others should teach, what old Lilly in his grammar renders thus:—

“Felix quem faciunt aliena pericula cautem.”

Happy is he whom other men's harms do make to beware.

VITAL PROPERTIES.

As life can be known through its manifestations only, we shall next proceed to consider generally the vital properties, which are as follow:—1. The power life confers of resisting the laws which influence inorganic bodies; 2. organization; 3. assimilation; 4. reproduction; 5. death.

We shall take each seriatim, and briefly enumerate some facts illustrative of these important vital properties.

1. With death or the absence of life come those changes which are but too familiar to us all. The individual who,

with buoyant spirit, has borne the extremes in the frigid and torrid zones, when deprived of this preservative principle, falls quickly, even in our own temperate latitudes, into decomposition and decay. These changes, you are aware, are esteemed the certain distinction between the state of death and that of trance. Curious cases are recorded of persons being buried owing to apparent death. It is plain, should doubt arise in any instance, it would be your duty to direct that interment be postponed, until the foregoing unequivocal symptoms shall or shall not be observed. In hibernation a sort of analogous condition obtains—life still existing although its more ordinary manifestations are suspended. The external surface is cool, the internal warm. It is a remarkable fact, that if the cold to which the hibernating animal is exposed be so intense as to endanger its existence, life takes the alarm—its dormant functions are aroused in order that a sufficient quantity of animal heat shall be developed, to meet the contingency and its dangerous consequences.

A striking illustration of the necessity for extreme caution, in reference to the apparently dead, will be afforded by the following quotation from Beaupré's *Treatise on Cold*, p. 296.

“The hysterical paroxysm is sometimes carried to such a height that there is loss of motion and feeling, almost absolute suspension of respiration and circulation, and apparent death. It is probable that fatal mistakes, against which one cannot be too watchful, when the question respects the quick decease of persons affected with nervous maladies, have caused the too hasty burial of women, supposed dead, in whom, however, total absence of life was simulated by one of those violent attacks of hysterical catalepsy and asphyxia, which we know may last two or three

days ; or, by one of those syncope^s accompanied with extreme weakness which enchains the vital energies. Tissot relates the case of an officer, who had travelled post for several days : on alighting from his horse, he fell into a faint that resisted all ordinary remedies ; he was saved by plunging him into a bath of iced water."

"The police regulations should give sanction to the advice of Klein :—" *Pro mortuis habitæ ante diem tertium terræ non mandandæ.*" (?) (That is, burial should not be performed before the third day.)—"I shall on this point cite with pleasure the history of a case, in which the illustrious Barthez obtained such brilliant success from the use of cold, and tasted the inappreciable delight of rescuing from the tomb, a woman about to be inhumed alive. (Eloge de Barthez, etc., par Baumes, Montpellier, 1816.) A lady of the Queen's palace, eminently endowed with that constitution called nervous, fell sick at a time that Barthez, her physician, being himself sick, could not attend. Pain threw her into delirium, her sufferings reached their achme : an overpowering agony plunged her into death-like swoon. Tears had been flowing ; her coffin was preparing. Barthez heard it, jumped from the bed where sickness detained him, flew, suspended the terrible burial preparations ; called for ice, and covered with it the cold inanimate body. How was his happy audacity rewarded ? The heart whose movements had been suspended, began to beat ; heat diffused itself through the limbs ; with that life was developed, and that corpse, that was about to be consigned to the last asylum of mortality, resumed motion and speech ! At this recital I see the detractors of medicine rest dumb and confounded."

We published a case of collapse of the vital powers in the Dublin Journal of Medicine, May, 1832, in which cold

aspersion succeeded after all other stimulants had failed. When sinking, the patient's face and neck were sprinkled by means of a hearth brush previously immersed in cold water.

The power of resisting the influence of extreme heat was well known to an adventurous girl, who was in the habit of sweeping out an oven when the temperature was at 288° , 76° , above that at which water boils. As soon as the scientific world were aware of this exploit, Drs. Fordyce and Blagden ventured to submit their persons to a heat of 264° , natural temperature or blood heat, being 98° .

We shall explain fully, in a future lecture, how the system disposes of the superfluous heat, by evaporation of the secretions poured forth both from the skin and lining membrane of the lungs: a partial illustration of which is afforded by the apparently dangerous feat of licking a red-hot poker; the heat required for evaporating the secretion upon the tongue, removes the injurious agent, which would be inevitably destructive if applied to a perfectly *dry* surface. We saw M. Chabbert, after retiring from an oven, where he had remained while a beef-steak was roasting. His whole skin teemed with perspiration passing off from the surface in the state of steam. Here the difference of effect upon dead and living animal matter is at once obvious.

The cooling effects produced by watering our streets in summer, and by a refreshing shower, are readily explained, when we calculate the considerable quantity of heat carried off by evaporation. You have all perceived by the goose-skin state of the surface how cold tends at once to arrest perspiration. The bulb of a thermometer placed at the root of the tongue of an individual, exposed to the ex-

extremes of heat and cold in the most southern and most northern regions, will indicate an equable temperature, namely, 98° . Plants have also the power of preserving a standard temperature under like circumstances, owing to their possessing this property of life.

We may here state that weakly individuals are incapable of resisting the extremes, or sudden alternations of temperature, owing, perhaps, to a deficient development of the vital powers. How commonly do we hear them exclaim, I am the warmest of the warm in summer, and the coldest of the cold in winter. Catching cold when asleep in the open air, is a matter of familiar observation; and, it is well known, the invincible tendency to sleep which occurs when individuals are exposed to the intense cold of the most northern latitudes. To sleep under such circumstances is almost inevitable death. During an excursion in Terra del Fuego, with Sir Joseph Banks and nine other individuals, when the cold was intense, Dr. Solander said, "Whoever sits down will sleep, and whoever sleeps will wake no more." Notwithstanding Dr. Solander gave the precaution, he was the first to feel the effects of the cold, and his companions were obliged to yield so far to his entreaties, as to allow him to sleep for five minutes. With the utmost difficulty he was roused. Two black servants also slept and perished.

It would appear, as may be inferred from what has been already stated of hybernation,—that the living principle partakes of the dormant condition of the body, and is hence less capable of exercising its ordinary preservative power. It may also be justly said, in reference to the effects of temperature, that "extremes meet," for mortification or death, of the living solid, is equally the result of either.

Worms in the alimentary canal resist the agency of the gastric juice so long as they are alive; but when dead, they are then subjected to the laws which govern inanimate matter, and are, consequently, digested or expelled like the ordinary contents. This fact affords a good reason for using cold-boiled water, as the high temperature to which it is raised must kill the animalcules that may be found in this fluid, and thus they are rendered easy of digestion.* It is a remarkable circumstance, first observed by John Hunter, and referrible to the same principle, that the gastric juice will, when the individual dies, dissolve the very stomach that had secreted this powerful solvent, and had resisted its action when living. The knowledge of this fact was the means of acquitting an individual accused of the crime of poisoning.

2. We shall next briefly consider what is meant by *organization*. The agents by which vital acts or functions are discharged are called organs; hence, life and organization are but convertible terms. Organized beings are living creatures, and living beings are, without exception, provided with organs, for they are the instruments of life. Organization implies a variety of parts; hence, animate objects are heterogeneous, inanimate homogeneous; or analogous to the objects of chemical attraction and attraction of aggregation: the former consists of dissimilar parts held together by affinity; the latter, of similar parts united by cohesion. It is plain, that as functions are discharged by organs, the greater number of the former that are exercised by any individual, the greater variety of the latter

* The insipidity of water thus treated may be removed by restoring its combined air, that had been expelled by boiling, which may be readily effected by briskly shaking this fluid in a decanter not quite full.

must be possessed by that being: hence, we speak of man as standing in the highest place in the scale of organization.

3. *Assimilation.* The remarkable power that organized or living beings possess, of converting matter dissimilar to their substance, into part of themselves, rendering it in every respect similar to their own structure, as a material of nutrition, for growth and repair—this vital process or property is well named assimilation.

4. *Reproduction.* This is a vital function, without which there could be no continuance of either animals or vegetables. Every quarter of the world teems with life, but each individual is doomed to run a certain routine of existence, and then die, having left a successor as the result of this function.

5. *Death* is the inevitable termination of life. Infancy, childhood, adolescence, manhood, old age, decrepitude, are all but the several stages of life's journey to

“ That undiscover'd country, from whose bourn
No traveller returns.”

We endeavoured, on one occasion, to account for the origin of his disease, in an octogenarian friend of ours, when the old gentleman replied, with an incredulous shake of the head, “ Aye, it may be all true, but *I* believe that eighty years of age is my disease—the ‘wear and tare’ of fourscore years; the use and abuse of a fabric, whose machinery has suffered many a shock and many a jar.” We need not add another word to prove, that the energies of life decline as certainly as the organs, by which the properties of the vital principle are manifested.

Antenrieth says, “ Those organized bodies only, which constantly strike fresh roots,—as the creeping plants, for

example, by means of runners ; or as many trees, by means of descending branches,—do not die. In all these cases, the new sprout forms at one period a part of the old individual, at the same time that it is a new and independent being. But even in these plants, the old stem always perishes, and the vital force continues active only in the new offset, which, in its turn, continues to extend on the one side while it dies on the other. What here takes place connectedly,—namely, decay on the one side, and the formation of a new living body on the other,—is effected in an interrupted manner in man and the more perfect animals. The young is separated from the parent, as a new living body, before the old being perishes, and the original *individual* dies, while the *species* seems to be immortal.”

In concluding the present lecture, I wish now to mention, that the popular form of address does not admit of learned or lengthened observations on any part of our subject. I made, notwithstanding, several long quotations from Dr. Johnston’s review of the “unknown” author upon the “*Discovery of the Vital Principle*,” because it was done in a truly Irish, witty, and admirable manner by our talented countryman ; and, consequently, was most appropriate material for one, whose purpose, in these lectures, is both to instruct and to amuse—the “*utile dulce*.”

Cast to the winds and the waves all the absurdities—no matter how learned, ingenious, or plausible they may be—that you will find in the works of a host of authors, that have written upon the unfathomed and unfathomable subject—life.

Presumptuous longing for forbidden fruit was the original sin of man, and from it followed the direful penalty—death.

The Creator has, in his mercy, withheld the knowledge

of the time when we are to pay the awful debt entailed on sin, because such knowledge would embitter our lives, more especially, as we approached to the doomed period of dissolution. In like manner, were we aware of what life is—its essence—its seat, we would, doubtless, be filled with continued apprehensions about the safety of that quarter in which the vital principle was known to reside.

Let us, as a legitimate object, endeavour to learn nature's laws, and what life does ; but, let us not waste our labours upon the insane pursuit of what life is,—that emanation of Him, whose ways are as inscrutable as they are wonderful and merciful.

“ All nature is but art unknown to thee ;
All chance, direction which thou eanst not see ;
All diseord, harmony not understood ;
All partial evil, universal good ;
And, spite of pride, in erring reason's spite,
One truth is clear—WHATEVER IS, IS RIGHT.”

I will add but two lines more from the same immortal bard :

“ Know then thyself, presume not God to scan ;
The proper study of mankind is man.”

LECTURE II.

Vegetables—Animals—Classifications.

HAVING, in the previous lecture, considered, generally, the properties of living beings, namely, vegetables and animals, we come next to draw a line of distinction between these two great kingdoms of nature. The differences have reference to structure and functions, or, in other words, to their anatomy and physiology. “ *These distinctions, so well marked in the higher orders of animals and vegetables, as a tree, a man, disappear in the lower grades, where the animal and vegetable kingdoms approximate ; and there are some species about which there is doubt whether they should be reckoned animals or plants. Many of the polypi are destitute of any power of locomotion, and appear to be void of sensibility ; while some of the algæ possess irritability, and consequent mobility, in a very high degree, and have much of the character of animals.* The sponges (porifera) apparently the simplest in structure of the various tribes of animals,*

* “ Irritability must not be confounded with sensibility. Plants are irritable, but not sensible ; the muscles also, when separated from the animal body, are still irritable (contractile) but they are not sensible. Plants cannot be affirmed to possess sensibility, unless they manifest consciousness. Manifestations of sensation and voluntary motion are the sole characteristic mark of the simplest animals.” (*Muller.*)

approximate very closely to vegetables. The *polypi vaginati* were placed among vegetables in Tournefort's arrangement; more lately, some species, formerly supposed to be confervæ, have been removed from vegetables, and placed amongst the simplest tribes of animals. Some botanists hold the singular doctrines, that, in certain cases, metamorphoses of plants into animals, and *vice versa*, take place; and that the animal kingdom approaches the other two in some of the simpler algæ, which have somewhat of a crystalline texture.

This difficulty of distinguishing plants and animals is found only in the lower tribes of each. In the *higher orders*, the differences are marked, as the following comparison will show :

PLANTS,	ANIMALS,
1. Are fixed, having <i>no</i> power of <i>locomotion</i> , no system of contractile museles.	1. Have a set of contractile fibres, (museles,) and hence the <i>power of locomotion</i> .
2. <i>Have no consciousness of existence, no experience of any wants, no power of selecting food.</i>	2. <i>Have consciousness of existence; a feeling of wants which they endeavour to supply; a power of selection among the materials they find.</i>
3. Insensible to all external impressions, except those of touch, heat, and light : <i>no nervous system.</i>	3. <i>Possessed of a nervous system</i> , and senses for communication with the external world.
4. Can live on inorganic matter alone.	4. Feed only on organic bodies, animals and vegetables.

5. Have no internal cavity or sac (*stomach*) for receiving their food.

5. Have a stomach,* or internal receptacle, into which the food is received.

6. Contain much solid matter.

6. Contain a large portion of fluids.

7. Consist of few elements.

7. Elements more numerous.

8. Carbon (charcoal) their leading element, and contain little nitrogen.

8. All contain a large quantity of nitrogen.

9. Slowly decomposed, when dead.

9. Decompose rapidly, when dead.

Generally speaking, then, a plant is a living being, destitute of sensation, and any power of voluntary motion arising from the growth of a seed or bud; consisting of a tissue of cells, or *cells and tubes*, which contain and circulate fluids; fixed to one spot by a *root*, from which a stalk or *stem* grows upwards, which bears and spreads out to air and light *leaves* and *flowers*, from the latter of which proceeds the *fruit* containing the *seed* similar to that from which the plant sprung." (*Reid's Botany.*)

* "Animals are distinguished from plants, however, not merely by sensation and voluntary motion. These attributes necessarily modify the other functions which animals possess in common with plants. This is very beautifully set forth by Cuvier. Vegetables fixed to the surface on which they grow, absorb immediately, by their roots, the nutritive particles of the fluids which permeate them. Animals, on the contrary, which generally are not fixed to one spot, but either wholly change their situation, or at least, as polypes of a solid stem, seize their food, must have the means of carrying about with them the store of fluids necessary for their nutrition. By far the greater number have an internal cavity, into which they introduce the matters intended for their nourishment, and in the parietes of which arise the absorbent vessels, which, as Boerhave aptly remarked, are true internal roots." (*Muller.*)

As tables help the memory very much, we shall beg to use one now, which will briefly recapitulate the heads of our subject from the commencement.

TABLE I.

BODIES.

- | | |
|----------------|-------------|
| 1. Inorganic ; | 2. Organic. |
|----------------|-------------|

Organic.

- | | | | |
|---|----------------|----|------------|
| { | 1. Anatomy, | or | Structure. |
| | 2. Physiology, | „ | Function. |

LIFE : ORGANIZATION.

Properties of Life.

1. Resistance of laws of matter.
2. Organization.
3. Power of assimilation.
4. Reproduction.
5. Death.

ORGANIZED BEINGS.

- | | |
|-----------------|-------------|
| 1. Vegetables : | 2. Animals. |
|-----------------|-------------|

Vegetables.

- | | |
|----------------|------------------|
| 1. Nutrition : | 2. Reproduction. |
|----------------|------------------|

Animals.

- | | |
|----------------|----------------------|
| 1. Nutrition : | 2. Reproduction : |
| 3. Sensation : | 4. Voluntary motion. |

It is plain, that when we are engaged in the examination of the structure or parts of vegetables or animals, we are employed as anatomists.* When the former are the subjects of our examination, we call it botany ; when the latter are

* Ανατίμνω, to dissect.

explored by the scalpel, we name it anatomy, or dissection properly so called. If the subject be man, we designate it human, but if any other animal, it is comparative anatomy. We call the latter comparative, because in this the chief object is to compare the structure with the former, and to profit by the analogy that so commonly obtains. Indeed, the first dissections made were those of brute animals, and inferences were thence drawn concerning the internal structure of man. We shall often, in the course of these lectures, have to allude to anatomy in those and other senses, and which we shall take occasion then more fully to explain; for without knowing the precise import of the terms employed, you cannot form clear notions in reference to the ideas we would wish to convey; or, as Locke expresses it, “who then can wonder if the result of such contemplations and reasonings about little more than sounds, whilst the ideas they (auditors or readers) annexed to them are very confused or very unsteady, or perhaps none at all,—who can wonder, I say, that such thoughts and reasonings end in nothing but obscurity and mistake, without any clear judgment or knowledge?”

As we find tables so useful for recapitulation and reference, we shall now present you with a second.

TABLE II.

ANATOMY.

- | | |
|----------------|---------------------|
| 1. Vegetables; | Botany. |
| 2. Animals: | Comparative: Human. |

HUMAN ANATOMY.

- | | | |
|----------------|--------------|--------------|
| 1. General, | is | Structural. |
| 2. Particular, | ,, | Descriptive. |
| 3. Regional. | 4. Surgical. | 5. Morbid. |

STEAM ENGINE.

1. Parts,	Anatomy.
2. Motion,	Function.
3. Passive agents,	Levers, wheels.
4. Active agents,	Steam. (power.)
5. Steam,	Heat.
6. Heat,	<i>Life.</i>

ANIMAL.

1. Parts,	Anatomy.
2. Motion,	Function.
3. Passive agents,	Bones.
4. Active agents,	Muscles. (power.)
5. Muscles,	Nervous system.
6. Nervous system,	<i>Life.</i>

From an examination of the foregoing table it will appear, that there is a striking analogy between the steam engine and an animal, or at least so much as will justify us in selecting this familiar illustration. Heat in the one, and the nervous system in the other, are, you will perceive, the last links, save life; and as heat (caloric) is present in all bodies, and cannot be wholly separated from them, it may be esteemed in inanimate matter what life is in organized beings. Besides, the philosophic world are still undecided as to the real essence of each. "Galen, and the ancients, generally conceived animal heat to be an innate or primary quality of the body, and that it is contemporary with *life*." (*Bostock*.)

It is plain, then, that anatomy has for its subject, structure; and that structures variously combined, constitute the different organs of an assemblage of which the entire body is formed. An organ, we have seen, is an instrument, dis-
 { charges a certain office which is called a function. The eye,

{ for example, is an organ, and the office or function it performs is vision. Now, when a number of organs conspire for effecting a certain end, that assemblage is named an *apparatus*. The food has to undergo mastication, swallowing, the action of the gastric juice, and so forth, respectively, in the mouth, gullet, stomach, and intestinal canal, before its nutritive part can be eliminated; consequently, these organs, so concerned in digestion, (the end,) when collectively considered, give us a good example of what is meant by an apparatus. Magendie says, “The number of apparatuses, and their disposition, constitute the difference of animals.”

{ As an assemblage of all the organs constitute the parts of the whole body, or its anatomy, so the consideration of the functions exercised by these organs constitutes its physiology. The latter is the observation of the individual while life and health are present; the former is entered upon after death, except in the performance of surgical operations and experiments upon animals, when it is often a dissection or anatomy of the living.

Classification of Animals.

In order to study physiology with advantage, we should make some classification of its objects, namely, vegetables and animals. Certain functions, we have seen, are common to both, (see Table I.,) as the nutritive and reproductive; and hence, these are called organic or vegetative, to which, in animals, are superadded sensation or perceptibility, and voluntary motion.

The anatomy and physiology of the vegetable world, called Botany, is a most interesting science; but, in this department, there is, even in popular treatises, too much

of anatomical detail, and strange uncouth terms, in-one-word-unmentionable; so that botany has been not inaptly designated "a science of names." We must leave to another Darwin the pleasing pursuit, of rendering truly popular and familiar the loves and the language of plants, while we turn our attention to the other organic kingdom, namely, animals.

The mode of classifying animals in reference to their peculiar physical characters or conformation, would appear at first sight a very natural plan; a sort of appeal to our senses which all can understand. This is chiefly the basis of the celebrated Cuvier's classification throughout.* Grant prefers selecting in the divisions, some essential difference not observable but by dissection; and, from close connection existing between life and the nervous system, (see Table II.) he makes modifications of the latter the ground of his classification.

In the following table, in which the examples appended are added by Mr. Evers,† under the head "Division," in each of the four *sub*-kingdoms, the first name is that applied by Grant; the second, that used by Cuvier.

* "Without any fixed principle for the establishment of his primary groups, Cuvier divided the animal kingdom into the *radiated*, the *articulated*, the *mollusous*, and the *vertebrated* divisions, which have been generally adopted by naturalists." (*Cyclopædia of Anatomy and Physiology—Animal Kingdom.*) In other words: 1. Animals that have a rayed or branched figure; 2. jointed; 3. pulpy; 4. with back bones, called *vertebræ*. It is plain, that so far as these divisions—and indeed almost throughout the classes and orders—a reference to conformation or peculiar physical characters in regard to *structure*, was the groundwork of the classification of this distinguished naturalist.

† We can strongly recommend the admirable work of our talented friend, Mr. Evers, on Comparative Anatomy, as the best epitome of the subject. The author has fully redeemed the pledge given in the title-page, "*Sparsa coegi.*"

TABLE III.

“CLASSIFICATION OF ANIMALS.*

Grant's Division of the Animal Kingdom.

DIVISION.	CLASS.
I. CYCLO-NEURA, vel RADIATA.	1. Polygastrica... <i>Exam.</i> Monad, madreporc.
	2. Porifera..... — Sponges.
	3. Polypifera..... — Polypes, corals.
	4. Acalephæ..... — Medusa, actinia.
	5. Echinodermata — Star-fish, sea-urchin.
II. DIPLO-NEURA, vel ARTICU- LATA.	6. Entozoa..... — Intestinal worms, hydatids.
	7. Rotifera..... — Patella.
	8. Cirrhopoda..... — Barnacle, triton.
	9. Annelida..... — Earthworm, leech.
	10. Myriapoda..... — Scolopendra.
	11. Insecta..... — Bee, butterfly.
	12. Arachnida..... — Spider, scorpion.
	13. Crustacea..... — Lobster, crab.
III. CYCLO-GANGLI- ATA, vel MOLLUSCA.	14. Tunicata..... — Ascidia intestinalis.
	15. Conchifera..... — Muscle, oyster.
	16. Gasteropoda... — Slug, snail.
	17. Pteropoda..... — Clio, hyalœa.
	18. Cephalopoda... — Cuttle-fish.
IV. SPINI-CEREBRA- TA, vel VERTEBRATA.	19. Pisces..... — Salmon, shark, eel.
	20. Amphibia..... — Frog, toad, proteus.
	21. Reptilia..... — Tortoise, lizard, serpent.
	22. Aves..... — Eagle, heron, duck.
	23. Mammalia..... — Man, kangaroo, whale.

Many other arrangements of the animal kingdom have been proposed by different zoologists; some, as Linnæus, founding their basis of classification on the vascular and respiratory systems, and others on the peculiarities afforded by the reproductive organs. Aristotle divided all animals into those with, and those without red blood; and Lanark into the apathetic, the sensitive, and the intelligent.”

* The most abstract division is, into those without back bones, and those with these parts; or, 1. Invertebrated, and 2. Vertebrated.

It may be said, that the preceding observations and this table are rather too much of comparative anatomy for general readers. But they were required, as we shall find it necessary hereafter, in considering the various functions, to borrow that illustrative information and collateral light which the consideration of this subject is well calculated to afford, in reference to man.

We have already explained what is meant by, 1. radiated, 2. articulated, 3. molluseous, 4. vertebrated animals. (See note.) We come next to the meaning of Grant's divisions. The names are indeed explanatory in themselves, viz.: 1. *Cyelo-neura* implies that the nervous (*neura*) system of the lowest classes of animals (radiated) is found in the form of filaments disposed in a *circular* (*cyelo*) manner around the oral extremity of the body. In 11. *Diplo-neura*, it means a *double* (*diplo*) chord, extending along the whole of the ventral surface of the body; a nervous structure common to the articulated class of animals. 111. *Cyelo-gangliata* implies, that, in the molluseous classes, the nervous system forms a transverse series of ganglia (small roundish bodies) *around* (*eyelo*) the gullet. iv. *Spini-eerebrata* indicates a nervous system presented by the vertebrated classes of animals, consisting of a nervous chord (spinal marrow—*spini*) developed anteriorly into a brain, (*eerebrata*,) and protected by back bones and skull.

It is plain, that the three former divisions are animals without vertebræ, and hence called invertebrated; the last is the vertebrated division. Under one of its classes, (Table 111.) *mammalia*, or suck-giving animals, we find as examples, man, kangaroo, whale, because all three are supported alike soon after birth “at the breast,” or *mammæ*.

Having thus given an outline of the arrangement of

animals, so far as we think necessary for the purpose in view, we shall next beg to direct your attention to a classification of the functions of man.

Various divisions of the functions of the animal economy have been proposed. What we have been in the habit of adopting for several years is that of Richerand, as the ground of his classification—namely, the object in view—has appeared most natural, simple, and instructive. We shall refer you, at once, to this physiological synopsis, and then offer some brief commentary on the classifications proposed by other writers.

TABLE IV.

THE FUNCTIONS OF THE ANIMAL ECONOMY ARE DIVIDED
INTO TWO CLASSES :

- I. Those concerned in the preservation of the Individual.* }
II. Those concerned in the preservation of the Species. }

The first class is divided into the following orders,
viz. :

First Order—Nutritive Functions, is subdivided into the following Genera, viz. :

<i>First Genus.</i>	<i>Second Genus.</i>	<i>Third Genus.</i>
Digestion.	Absorption.	Circulation.
Seizing the Food,	Absorption of Chyle,	Action of the Heart,
Mastication,	————— Lymph,	————— Arteries,
Deglutition,	Action of Absorbents,	————— Capillaries,
Digestion in the Stomach	————— Glands,	————— Veins.
————— Duodenum,	————— Thoracic duct	
————— small intestine		
Excretion.		
<i>Fourth Genus.</i>	<i>Fifth Genus.</i>	<i>Sixth Genus.</i>
Respiration.	Secretion.	Nutrition.
Action of the Parietes of	Formation of Serum,	Different in each part,
the Chest,	Follicular or Mucous	according to its pecu-
Action of the Lungs,	Secretion,	liar composition.
Changes produced in the	Glandular Secretion,	
Air and Blood,	Cutaneous ————	
Production of Animal		
Heat.		

Second Order—Relative Functions is subdivided into the following Genera, viz. :

<i>First Genus.</i>	<i>Second Genus.</i>	<i>Third Genus.</i>
The Sensations.	The Motions.	Voice and Speech.
Organ of Sight,	Muscles,	Voice articulated, or
——— Hearing,	Muscular Action,	Speech,
——— Smelling,	The Skeleton,	Voice modulated, or
——— Tasting,	Articulations,	Singing,
——— Touching,	Erect position, or stand-	Lisping,
Action of the Nerves,	ing at rest,	Stammering,
——— Brain,	PROGRESSIVE MOTIONS,	Dumbness,
Faculties of the Mind,	Walking, Running, Lea-	Ventriloquism.
Perception, Memory,	ping, Swimming, Fly-	
Judgment, Reasoning,	ing, Creeping,	
Volition,	Motions of the Upper	
Sleeping and Waking,	Limbs,	
Dreams and Sonnambu-	Attitude, Gesture.	
lism.		

Of the *second class* we shall consider *here* the following only :

	Laetation.	{ Office of the Mammæ, milk.
Periods of Growth.....	{ Infancy Puberty, Youth.	Dentition, Ossification.
	{ Temperaments Idiosyncracies	{ Sanguine, Muscular, Bilious, Melancholic, Sympathetic, Nervous. Peculiarities.
Manhood	{ Races of the Human Species	{ Arabo—European. —Mongolian— Negro—American. —Hyperborean.
Periods of Decline.....	{ Turn of Life, Old Age, Decrepitude. Death, Putrefaction.	

We purpose making the foregoing table the chart by which we shall be guided, both as to the order and method to be adopted in the consideration of the several functions.

Grimaud—whose classification Richerand has adopted, with some slight modification—justly observes: “ The division which I lay down is not to be strictly adopted as being absolutely true. It is a mere hypothesis, to be attended to only in so far as it assists in arranging one’s ideas

in a more orderly manner. For every arrangement, even when arbitrary, is useful in laying before us a great number of ideas, and in thereby facilitating the comparison that is to be instituted among them. All the acts of nature are so connected, and are linked together in so close an union, and she passes from the one to the other by such uniform motions, and by gradations so insensible and so adjusted, as to leave no space for us to lay down the lines of separation or demarcation which we may choose to draw. All our methods of classing and arranging the productions of nature are mere abstractions of the mind, which does not consider things as they really are, but which attends to certain qualities, and neglects and rejects all the rest."

We shall allude briefly to some other classifications of the functions, made by distinguished physiologists. Bichat improved the old one, by substituting organic and animal, for vital animal and natural. Cuvier divided them into animal, vital, and reproductive. Magendie, those of relation, nutrition, and reproduction. Bostock into contractile, sensitive, and intellectual. Elliotson, and very many of the modern physiologists, adopt Bichat's classification. It has been offered as an objection to his arrangement, that all the functions should be esteemed animal; and again, as organs are their instruments, consequently, all the functions may be named organic. Perhaps we could adjust the matter thus. Bichat meant by the term organic, all those functions which are common to organized beings, namely, both vegetables and animals, which we have already seen (Table I.) are nutrition and reproduction. Let us call these *exclusively* by their PROPER name, *vegetative* instead of organic, and the term will embrace—according to Richerand's arrangement (see Table IV.)—the first order of functions for the preservation of the individual,

and also the functions for the preservation of the species. In the next place, the term *relative*, instead of animal, will indicate the sensitive, locomotive, and intellectual functions, which exclusively belong to animals, and will include (Table IV.) the second order of the arrangement we have given at the outset.

Vegetative will also at once serve to convey the idea that some of our functions are in common with plants; while the term *relative* will remind us, that by others we are put into relation or communication with the objects of the outward world, and they with us.

Indeed we may say, in the ordinary signification of the words, that the relatives or connections of an animal are much more numerous than those of a vegetable; and hence, the former requires these additional functions—well named *relative*—to maintain, as nature would indicate, “a good understanding” with all his relations.

We shall next take a general view of the functions for the preservation of the individual. These are divided into two orders. (Table IV.) In the first, the food acted upon by several organs, is ultimately assimilated to the body which it is destined to nourish: in the second, certain relations are established with outward objects. In the former, the functions are, owing to the seat of their performance, and the end in view, called internal, nutritive, and assimilating. They comprise the following: 1. Digestion eliminates the nutritive part; 2. Absorption conveys the latter into the blood; 3. Circulation carries the blood to all parts of the body; 4. Respiration, and 5. Secretion, purify this fluid. The blood so replenished, purified, and animalized, becomes now suitable for the end in view, namely, 6. Nutrition.

We shall take each of these functions separately, which,

collectively considered, form the apparatus of nutrition, and briefly consider the leading heads set forth in Table IV., adopting also the plan laid down by Magendie for the study of a particular function, which is as follows :

1st. General idea of the function.

2d. Circumstances which put the action of the organs into play, and which we call the *excitants* of the functions.

3d. Summary anatomical description of the organs that concur in the functions, or of the apparatus.

4th. Study of every action of the organ in particular.

5th. General recapitulation, showing the utility of the function.

6th. Relations of the function with those already examined.

7th. Modifications which the function presents, according to age, sex, temperament, climate, seasons, habit.

1. *Digestion, general idea of.* This function may be defined that process by which the nutritive portion of the food is separated from the excrementitious, for the purpose of appropriating the former to the growth and reparation of the animal system. This object, effected in some of the radiated animals, or zoophytes, in the most simple manner, is an exceedingly complicated function in the division mammalia, to which man belongs. In the former, as in some species of polypes, we find the animal a mere sac, like the finger of a glove ; its internal surface discharges the function of digestion ; its external, that of respiration. If we invert the animal, we also invert the functions ; we convert the external surface, that had performed respiration, into an internal digestive surface, or stomach, while that which had been stomach, in its turn becomes a respiratory surface, or analogous in office to lungs. This example, on the very confines of the animal world, must impress us with admiration, affording, as it does, so striking a specimen of

the simplicity of nature, and the wonderful adaptation of her works to contingent circumstances ! Does it not set us at once to reflect upon, and ask the question, is there any such identity or substitution in man, as regards his internal lining membrane, (called mucons,) and his skin ? The anatomist, the physiologist, and the physician all admit, that there is a continuity, an identity in structure, and the most remarkable analogies, both in health and in disease, between the functions of these two important membranes. But the further consideration of this subject will be resumed in another place.

In the digestive apparatus of man, the food undergoes several changes before the important object in view is effected. After chewing and mixture with saliva, it is received into the stomach, and is there converted into a homogeneous pulpy mass, called chyme : this mass is thence transferred into the intestine, where the chyme, subjected to a peculiar process, yields the nutritious fluid called chyle. In order that the chyle may be conveyed to the sanguiferous system, a distinct set of vessels, called lacteals, transmit this milky fluid that they had absorbed, to the blood, with which it is ultimately identified.

2ndly. We next come to consider *the circumstances which put the action of the organs into play, and which are named the excitants of the function.*

Hunger and thirst are the urgent excitants of the nutritive process. Providence, by influential agents, pleasure and pain, uniformly secures the exercise of those functions which, in the animal economy, are indispensable. The periods when food should be taken or abstained from, are indicated by instinctive feelings, which are hunger and thirst on the one hand, satiety and disgust on the other.

The final cause of these sensations is obvious to all, but the case is different with regard to the proximate cause.

To explain the latter, many novel and ingenious hypotheses have been framed : what appears least objectionable is, that it arises, like all other internal sensations, from the action of the nervous system, and from the influence of habit. Did it depend, as Dr. W. Philip, and very many physiologists have supposed, upon the action of the gastric juice, or any chemical cause, on the stomach, it would invariably be removed by the reception of food. But, in many cases, this consequence does not follow ; as in disease of the mesenteric glands, and cancer of the pylorus, (the orifice of the stomach next the intestine,) in which instances, the nutritive supply is either defective or cut off from the system. Children are usually the subjects of the former disease. Their wasted forms and inordinate appetite at once convince us of two facts : firstly, that the unusual quantity of food consumed by the individual does not go to nourish the system ; and secondly, although the child is almost constantly eating, yet still the craving appetite exists, because the latter is but a mere indication of the unsupplied wants of the body.

How commonly is it said of those whose chyle-making organs are deranged, and whose nourishment is consequently defective, that what they eat goes into an “ill-skin?”

The admission of nutriment through the skin and intestine, allaying the sensation of hunger, also proves the incorrectness of the theory which refers hunger to the action of the gastric juice upon the stomach. Again, according to the experiments of Dr. Beaumont, it would appear that the gastric fluid is secreted only during digestion.

“ If a narcotic be applied to the nerves, their power is paralyzed, and the sensation of hunger ceases ; such an effect is produced by the juice of tobacco, although by long habit the stomach may become indifferent to its operation.

Whenever the Indians of Asia and America undertake a long journey, and are likely to be destitute of provisions, they mix the juice of tobacco with powdered shells, in the form of small balls, which they retain in their mouths, the gradual solution of which tends to counteract the uneasy craving of the stomach. In like manner we may explain the operation of spirit in taking away the appetite of those who are not accustomed to it; while those who indulge in the habit, receive its stimulant without its narcotic impression. Lord Byron entertained a great dread of becoming corpulent, and on that account frequently abstained from food for several days together, appeasing the cravings of hunger by a wafer and a glass of brandy." (*Paris.*)

The experiments of Brachet upon a ravenously hungry dog, prove that the feeling of hunger is perceived by the brain, through the medium of the nerves, which convey the impression made upon the stomach; for when he divided these nerves, the feeling of hunger was immediately annihilated. Injuries of the brain are well known to be followed by vomiting, which is an instance of the sympathy reversed, namely, the stomach influenced through the medium of the same nerves, by the state of the brain.

We shall put this matter into the shape of a familiar allegory. Suppose, what really exists, that the mass of the working people in a large city, have no proper provision made for ventilation and cleanliness of their houses; no place appropriated for manly salubrious exercises and sports in an open plain, public baths, &c. &c. : these are wants that must, if continued, enfeeble and waste the body corporate.* The

* While this sheet is going through the press, we are happy to add, that the Royal College of Surgeons in Ireland is about to elect "a Professor to deliver Lectures on the provisions required for the preservation of the health of the public, and the precautions to be adopted for preventing the extension of disease."

representatives of the people, sympathize, as in duty bound, with the wants of their constituents: the former, as a natural course of events, transmit strong statements of such wants and grievances to head quarters, namely, the government, whose proper functionaries in the home department order the needful supply, through their trusty agent, to the great central organ of the people, and the latter disposes of it to the commonwealth as the wants of each distressed department require. We need scarcely say, that the wants of the people are those of the body; the representatives, the nerves of the stomach, which communicate with *head* quarters or government, the brain; the trusty agent is the stomach; "the centre of sympathy;" the central organ, the heart and its vessels, that carry the blood to the commonwealth, which is the body at large.

✓ We are all pretty familiar with the sensation of appetite or hunger, which indicates the want of solid aliment. "It is variable in its intensity and in its nature in different individuals, and even in the same individual. In some, its violence is excessive; in others, it is scarcely felt: some never feel it, and eat only because the hour of repast is come. Many persons perceive a drawing, a pressure more or less painful, in the region of the stomach, accompanied by yawnings, and a particular noise, produced by the gases contained in the stomach, which becomes contracted. When this want is not satisfied, it increases, and may become a severe pain: the same takes place with the sensation of weakness and general fatigue which is felt, and may increase so as to render the motions difficult, or even impossible."* (*Magendie.*)

* "In the siege of Jerusalem, and other ancient cities, we read of women driven by hunger to devour their offspring; and Captain Franklin was assured, near the Saskatchewan, that men and women were then living, who had destroyed and fed upon the bodies of their own families, to prevent starvation, in very severe seasons."

Some are apt to confound morbid feelings with hunger, and will often tell you, that they cannot say whether they are very sick or very hungry. "Certain circumstances render hunger more intense, and cause it to return at nearer intervals; such as a cold and dry air, winter, spring, cold baths, dry frictions upon the skin, exercise on horseback, walking, bodily fatigue, and, generally, all the causes that put the action of the organs in play, and accelerate the nutritive process, with which hunger is essentially connected. Some substances being introduced into the stomach excite a feeling like hunger, but which ought not to be confounded with it."

Let us, in the words of the same author, (Magendie,) enumerate some of the circumstances which produce an opposite effect. "There are causes which diminish the intensity of hunger, and which prolong the periods at which it habitually manifests itself. Amongst this number are the inhabiting of hot countries and humid places, rest of body and mind, depressing passions, and indeed all circumstances that interrupt the action of the organs, and diminish the activity of nutrition. There are also substances which, being brought into the digestive canals, prevent hunger, or cause it to cease, as opium, hot drinks, &c."

The art of cooking, in proceeding so far beyond its legitimate object—roasting and boiling—has been the cause of more stomach disease than we could calculate. Witness those dishes which appeal but too successfully to our senses, and induce our noses and palates—intended by nature as trusty sentinels—to become treacherous allies towards our oppressed stomachs.

The habit of taking wine freely at dinner, stimulates overmuch the stomach, and too often induces its owner to eat, under the impression of a deceptive desire for food.

How often have we heard those with small appetite naturally, or *then*, perhaps, without any, urged to take wine at dinner “to *make* them eat,” and thus, by oppressing an indisposed organ, lay the foundation for a fit of indigestion?

All those causes which tend to produce wear and tare of the body, or expenditure, will, as we have seen, necessarily induce an increased demand for supply, or in other words—hunger. On the other hand, the sedentary and the studious, that work the mind and not the body, do not experience much of this sensation, for the active and continued exercise of the organ of the mind—the brain,—while we are otherwise at rest, suspends the healthful play of our muscles, and the energetic discharge of the functions of digestion, respiration, and circulation. An anecdote is told of Sir I. Newton, which will illustrate this position. It is said, that an intimate friend of this profound philosopher entered his study unobserved, and as Sir I. Newton was absorbed in deep thought, heedless of his dinner, which had been some time laid, his visitor betook himself to the fowl, which he speedily devoured; and then, replaced the cover *in statu quo*. When the problem had been solved, the philosopher arose, addressed his friend, and next raised the cover, but quickly replaced it, saying, how forgetful I am! I really thought I had not eaten my dinner.

This circumstance proves sufficiently, that the hunger or appetite of this illustrious man, must not have been urgent or decided; were it otherwise, even with all his mind-absorbing occupation, he would not have been thus easily cheated into an opinion that he had dined.

We shall here cite a curious case which came directly under our own observation. A young gentleman of rather eccentric habits, remarkably indisposed for mental or bodily action, when in perfect health, went to bed as usual, on a winter's night; slept for upwards of sixty hours;

X { after this he was asked by the servant would he not take some breakfast: he appeared quite angry at being disturbed; took a cup of tea, “turned upon the other side,” and slept for forty-eight hours longer. He now arose of his own accord; but did not feel more than his ordinary appetite, which was generally very good. This gentleman could scarcely be persuaded that he had slept so long. His case presents us with an example of one in which both body and mind were buried in repose, by “nature’s soft nurse, balmy sleep.” It is plain, that he did not experience, during any part of these five days, the urgency of actual hunger, because there was little or no wear and tare—no expenditure. His bed was to him, what whiskey *used* to be to our now temperate countrymen, “meat, drink, and clothing.”

Those poor work-women who earn a miserable pittance by their needle, sit, I understand, the whole day, and scarcely *desire* to taste more than a bit of bread from morning until night. Too often, indeed, in these cases, the effects of sedentary habits are aggravated by poverty and the depressing passions.

The influence of the mind over the stomach, did not escape that accurate observer of nature, Shakspeare, when he makes Henry address Cardinal Wolsley thus:

.....“ Read o’er this,
And after this: and then to breakfast, with
What appetite you have.”

How soon the communication of melancholy tidings—say, the sudden and unexpected death of one beloved—deprives the hungry man about to sit down to dinner of all trace of appetite.

Here the impression made on the stomach, and conveyed to the brain, through the medium of the nerves that pass from one organ to the other, is at once suspended, nay overwhelmed, by the impression made upon the sensorium,

by the communication of the calamitous event. The wants of the system that were so urgently indicated but a few minutes previous, are still the same, unsatisfied, but they are now no longer perceived.

In like manner, when two sensations of a depressing nature, affect exclusively our moral being, the less is swallowed up in the decidedly greater ; "all other griefs in that wild grief forgot."

We often incorrectly consider an individual under such circumstances absent, apathetic, or at least eccentric, who conceals, "like a worm in the bud," a cankering care, which renders him indifferent to all minor afflictions, relative to himself or others. This is the man whose absent air we may describe in the words of Grey :

" Now drooping, woeful wan, like one forlorn,
Or craz'd with care, or cross'd in hopeless love."

What a difference is observable between the corporeal development of the laughing and the crying philosophers ; one is typical of laugh and be fat ; the other of weep and be thin.

As fat as a fool, is a common expression, and no less true, when he gets as much as he will eat. With him mental occupation, sedentary habits, or much sensibility, do not interfere with the exercise of the nutritive apparatus, and the indications given of the wants of the system. It should be here observed, that although an easy and pleasurable condition of the mind, contributes so essentially to the healthy exercise of the digestive organs, yet, the excitement produced by excessive joy, like the depressing effect of grief, supersedes or overwhelms the sensation of hunger, which, we have seen, is ultimately referable to the brain as the perceiving organ.

The observations we have made relative to hunger are

almost all equally applicable to thirst, inasmuch as they are both perceived notices served on the brain, of the necessity which then exists for receiving their respective supplies. But it is remarkable that what annihilates hunger, at the same time increases thirst; as we observe when under the influence of the depressing passions. The popular knowledge of this circumstance—joined with hospitality that is proverbial—no doubt leads to the liberal supply of tobacco, tea and whiskey, that are always afforded at an Irish wake, in order to soothe sorrow and drown grief, which are well known to be “always dry,” more especially upon such garrulous and tear-shedding occasions.

The apparent paradox of a person being hungry without a stomach, and thirsty without a throat, might admit of explanation by the fact, that nausea and retching may be produced by the injection of tartar emetic into the veins, after the removal of the stomach; and, “that gallons of water may pass the throat, and if it enter not the stomach, will not allay thirst. Aliments must be absorbed, in order that these sensations may be permanently satisfied.” It has been satisfactorily proved that the wants of the system, indicated by hunger and thirst, may be allayed by nutritive injections, milk baths, and by the infusion of fluids into the veins. Thirst is generally proportionate to the fluid secretions: witness nursing* on the one hand, and dropsy on the other; in this disease, thirst is an early and constant symptom; medicines which increase the secretions from the skin and kidneys, also increase this sensation. The influence of fear in this respect is very remarkable; hence,

* Nurses are indeed, legitimately, “thirsty souls;” but this should not sanction their excessive “potations” of XX porter, which not infrequently proves injurious to both nurse and infant, more especially to the former, in a moral point of view.

"Vox fancibus hæsit," under the impression of terror. In Annesley's work on the Diseases of India, a remarkable application of the knowledge of this circumstance is narrated as follows :

"The secretion of the saliva seems to be under the influence of the same mental emotions, as affect the functions of the stomach. Fear, anxiety, and various other depressing passions, diminish digestion, and most probably produce this effect by stopping the secretion of gastric juice. Observation shows us that they have a decided influence in lessening, or even in entirely arresting, the secretion of saliva : a circumstance not unknown to the observant nations of the east. In illustration of this, it may be mentioned that the conjurers in India often found, upon this circumstance, a mode of detecting theft among servants. When a robbery has been committed in a family, a conjurer is sent for, and great preparations are made. A few days are allowed to elapse before he commences his operations, for the purpose of allowing time for the restitution of the stolen property. If, however, it be not restored by the time fixed, he proceeds with his operations, one of which is as follows : He causes a quantity of boiled rice to be produced, of which all those suspected must eat ; and after masticating it for some time, he desires them all to spit it upon separate leaves, for the purpose of inspection and comparison. He now examines this masticated rice very knowingly, and immediately points out the culprit, from observing that the rice which he has been masticating is perfectly dry, while that which was masticated by the others is moistened by the saliva."

{ There are individuals who are almost always thirsty, and, again, others who are never so. We at present have two friends who are striking instances of this. The one,

a gentleman, constantly drinks before, during, and after dinner; while the other, a lady, states that she is never thirsty, and drinks at dinner because she thinks it wholesome.

We shall find that those who eat with most appetite have least desire for drink during meals. You will also observe a deficiency of the fluid secretions generally in those who are indisposed for drink.

Thirst is still more urgent than hunger. The former sensation is referable to the mouth, the gullet, and sometimes to the stomach. When long continued, the ordinary phenomena are "accompanied by a vague inquietude, by a general heat; the eyes become red, the mind is troubled, the motion of the blood is accelerated, the respiration becomes laborious, the mouth is frequently opened widely, in order to bring the external air in contact with the irritated parts, and thus to produce a momentary ease.* When the body, from any cause, has lost a great deal of fluid, we are to look upon the existence of thirst as quite natural then, and indicating the necessity for the required supply; but we are not to confound this legitimate demand with "the vicious *habit* of frequently drinking, and the desire of tasting some liquids, such as brandy, wine, &c., which cause the development of a feeling that has the greatest analogy with thirst." "A wet night makes a dry morning," but not a hungry one, owing to the feverish state produced by the excessive use of wine or ardent spirit, and the collapse of the stomach consequent upon its previous and pernicious excitement.

Some animals are able to support the want of food for

* "A horrid description of raging thirst will be found in the account of the black-hole of Calcutta. See Annual Register, 1758."

a length of time. "Salamanders, tortoises, and gold fishes may be kept for years without food; and it is well known that snakes will live for six months without eating. Redi found birds sustain the want of food for from five to twenty-eight days; a seal lived out of water, and without nourishment, for four weeks; dogs lived from twenty-five to thirty-six days without eating or drinking. Man does not generally support hunger and thirst longer than a week; hunger alone is borne much longer, especially in disease, and still more in insanity. The accounts of persons having lived without taking food for months and years, are, as Rudolphi with justice remarked, examples of deception."* (*Muller.*)

Young persons die soonest when exposed to privation of food, for in them the process of digestion is most active; and from the demands made, owing to the energy of the functions, the supply is soonest exhausted.

We shall conclude this portion of our subject by giving, in the next lecture, some opposite cases; one remarkable for abstinence, and the others no less singular for voraciousness.

* "IRISH CAVANAGH.—We have been regaled during the last week by the astonishing anti-hungry account of this total abstinence man, who has been visited in a garret in Lamb's Conduit-street, by no less a personage than one of his fellow-countrymen, Sir John Milley Doyle, K.C.B., (Keeper of Cavanagh's Breeches!) for they stripped the Patlander, for fear, as we suppose, that he should eat them. Cavanagh, they say, has not tasted food for eleven days!!! When will the march of Tom-foolery halt, or the march of humbug stand at ease? This visit was a prelude to an advertisement, stating that 'Mr. Cavanagh!!—(the poor garret man should be made Mayor of Garrat)—has been induced to exhibit himself.' *Induced*—what by? Not by starvation at any rate. Out upon such ridiculous trash!"—*Argus.*

LECTURE III.

CASE OF ABSTINENCE.

Y ONE of the best authenticated of these is that of Janet Macleod, published in the Philosophical Transactions for 1777, and certified by Dr. Mackenzie, the physician who drew up the report, and by the sheriff depute and other magistrates of Ross-shire. The girl had been healthy until the age of fifteen, when epileptic fits and fever reduced her to the lowest state of debility. Her appetite gradually diminished, until at last she refused all kind of sustenance; her jaws became closely locked, so that it was necessary that her father should open them with a knife when they attempted to make her swallow any thing. It was, however, in vain. She constantly rejected whatever was offered to be put into her mouth; and from Whitsuntide, 1763, for a period of four years, they never could ascertain that any thing passed down her throat except a pint of water, which she drank once at a draught, and a very small quantity of water from a mineral spring in the neighbourhood, with which they filled her mouth at another time. During this period she generally lay on her side, without moving; her eyes closed; her pulse beating faintly; her legs contracted, and bent backwards and upwards. Towards the end of the fifth year her jaws became unlocked, she appeared a little more lively, and partook occasionally of a small quantity of oaten or barley cake, crumbled in the hollow of her hand, and moistened with milk; she was able to leave her bed, but the account does not proceed so far as to say whether she ever reached any degree of health and strength.

CASE OF VORACIOUSNESS.

A Frenchman named Tarare, and described by Drs. Percy and Laurent, in some measure from their own observation, will form a good contrast to the Scotch girl. When a lad, he once swallowed a large basket of apples, after some person had agreed to pay for them, and at another time a quantity of flints, corks, and similar substances. The colic frequently compelled him to apply at the Hotel Dieu: he was no sooner relieved, however, than he began his tricks again, and once was but just prevented from swallowing the surgeon's watch, with its chain and seals. In 1789 he joined the mob, and obtained sufficient food without devouring for money. He was then about seventeen, weighing a hundred pounds, and would eat five-and-twenty pounds of beef a-day. When the war broke out he entered into the army, and devoured his comrades' rations, as long as better supplies from other sources rendered them of little value. But when at length his comrades stood in need of them themselves, he was nearly famished, fell ill, and was admitted into the hospital ambulant at Sultz. He there ate not only a quadruple allowance, the broken food of the other patients, and the waste of the kitchen, but would swallow the poultices and any thing else that came in his way. He devoured so many dogs and cats alive that they fled at the sight of him. Large snakes he despatched with the greatest facility, and once gobbled up in a few moments all the dinner that was provided for fifteen German labourers, viz., four bowls of curd, and two enormous dishes of dough, boiled in water with salt and fat. At another time he disposed of thirty pounds of raw liver and lights, in the presence of some general officers, who, finding that he could swallow a large

wooden lancet case, took the partitions out, enclosed a letter in it, and made him swallow it, and proceed to the enemy's quarters for the purpose of discharging it from his bowels, and delivering the letter to a French colonel who had fallen into the hands of the Prussians. This he contrived to do, enclosed the answer in it, swallowed it again, made his escape, discharged the case again, washed it, and presented it to Beauharnois and the other officers. Having, however, been well drubbed by the enemy, he refused any further secret service, and was re-admitted into the hospital to be cured of his hunger. Being no longer a novelty, he excited less interest, and felt it necessary to have recourse to sheep-folds, poultry-yards, private kitchens, slaughter-houses, and by-places, where he had to contend with dogs and wolves for their filthy food. He was detected drinking blood that had been taken from his fellow-patients, and eating bodies in the dead-house. The disappearance of a young child excited strong suspicions against him, and he was at length chased away and unheard of for four years, at the end of which time he applied at the Hospice de Versailles, wasted, no longer voracious, and labouring under a purulent diarrhœa; and he soon died, aged twenty-six. The body immediately became a mass of putridity. During his life he was always offensive, hot, and in a sweat; especially at intervals. His breath rolled off like steam, and his secretions were constantly very copious and intolerably fœtid. He was of the middle height, thin,* and weak. When he had eaten but moderately he was able to wrap the skin of his belly almost round his body. After a full meal he used to retire to a corner, and fall into a brutal state of insensibility. All the abdominal viscera

* His was indeed a good illustration of an "*ill skin*." See p. 45.

were found full of suppurations. His stomach was of immense size, and this has usually been the case in persons habitually gluttonous. A polyphagous idiot, opened by the same writers, displayed an enormous stomach, more resembling that of a horse than of a human being; the intestines also formed several large pouches in succession, which appeared like additional stomachs.

Some great eaters are prodigies of strength; as Milo, who killed an ox with a blow of his fist, and devoured it; and the fellow mentioned in a thesis published at Wittemberg in 1757, who once in the presence of the Senate ate up a sheep, a sucking pig, and sixty pounds of plums, stones and all, and could carry four men a whole league upon his shoulders. (*Elliotson.*)

As we are upon the subject of great eaters, it may not be out of place to allude here to knife and stone eaters, many curious cases of which are on record. One of the most remarkable may be found in the *Med. Chi. Trans.*, vol. xii. It is that of a man who lived ten years after having swallowed a number of clasp knives. The following description was drawn up by the man himself, while in Guy's Hospital, and read after his death to the Medical and Chirurgical Society of London by the late Dr. Marcet. It is headed:

“ Narrative of John Cummings, drawn up by himself.

A miraculous recovery of a seaman who swallowed a number of knives at three different times, as you see in this little book.” The little book begins by informing us that, in the month of June, 1799, he and some of his shipmates being at Havre, went into a tent and saw a man swallow a knife, for which sight they paid a *livre* each. On their return to the ship, they sat down and began to enjoy the former part of the night as follows: After drinking very

hearty, one of the company opened the story concerning the above play-actors, which, he repeated, that it was an extraordinary affair to swallow knives. The author made answer directly, and told him that he could swallow knives as well as they could. The company present took notice of the above answer being made so quick, and, for the curiosity of the circumstance, made a serious inquiry if he was man enough to perform what he had already stated. He did not like to go against his word, neither was he anxious to take the job in hand; but by having a good supply of grog inwardly, he took his own pocket knife and tried it first, which slipped down his throat with great ease; and by the assistance of some drink, and the weight of the knife, conveyed it into his stomach. But still the spectators seemed not satisfied with one, but made further inquiry if he could swallow any more? He replied in a word, 'All the knives on board the ship!' By this answer there was three more knives presented upon the table, which he swallowed in a few minutes, the same way as the former. And by this bold attempt of a drunken man, the company was well entertained for that night. In the course of two days after, he passed three of the knives, but never could ascertain what became of the fourth. However, it never gave him any pain or uneasiness; and shortly after he took his departure from France, and never thought on swallowing any more knives for the space of six years; after which you shall see as follows: Boston, March 13th, 1805, was in company where he gave his report of his success in swallowing knives in France, in June 1899. Two or three of the company told him plain to his face, that it was impossible for any man to do such a thing, and that it was nothing but false report, which he took it very highly affronted; but, after considering a short time, told the

company he was the same man still, and, if it was agreeable, that he would satisfy their curiosity. One small knife was presented to him, which he swallowed instantly. In the course of that night he swallowed five more, which made six in all. Next morning he had a thousand visitors, but gave very few of them admittance. It happened in the course of that day that he swallowed eight more, and six the night before, which made fourteen; and that was the 14th of the month; so he had swallowed a knife for every day the month was old. Next morning was the 15th; he was taken very ill, with constant vomiting and pain in his stomach. Directly he was brought to Charleston Hospital, and betwixt that period of time and the 28th following, was safely delivered of his cargo, and the whole of them are preserved in the Infirmary of that city. His next fit of swallowing was brought on in nearly the same manner on board H. M. S. Isis, December 4th, 1805; and in the course of that night he swallowed five knives. Next morning, being the 5th day of the month, the ship's company was anxious to see the performance renewed the second time. By the encouragement of the people and the assistance of good grog, (and his lot was ordained to be miserable after, in consequence of the same,) he swallowed nine that day to his own knowledge; and the spectators informed him afterwards that he swallowed four more that he knows nothing about: they were all clasp-knives, and some of them very large. Next day he was obliged to apply to the surgeon, and continued for a long time an invalid, occasionally suffering much pain, which was always increased just before he passed parts of the knives. June 12th, 1807, he was discharged this ship in consequence of his complaint, and likewise being found at the survey unserviceable; after which he was admitted into Guy's

Hospital, under the care of Dr. Babington. Great many never believed such a circumstance. After five weeks being in the Hospital, was presented out, and was in lodgings for the space of five weeks; but, finding himself getting worse, was obliged to make the second application, and was re-admitted under his physician again. There is little to be added to this narrative, which was found in the pocket of the unfortunate man after his decease, but that he became gradually worse, and died March, 1809, in a state of extreme emaciation. On opening his stomach, between thirty and forty fragments were found in it, being evidently pieces of handles, blades, and back-springs of knives. They are preserved in the Museum of Guy's Hospital."

We were called some years ago to a person who, while chewing a crust, dislodged an artificial tooth which had been fastened by a projecting little screw into the fang of the original tooth. The artificial one was restored to the former position after its travels, from which the patient did not suffer the slightest inconvenience. Children frequently swallow marbles and other small bodies, which pass off without causing any uneasiness.* We are quite certain that those who are in the habit of carrying pins in their mouths swallow them very often. Curious cases are recorded of pins and needles being found in quarters remote from the stomach, and which are supposed to have made their way to the skin from this organ or the bowels.

A patient of ours had been in the habit of applying a leech or two to the lining membrane of the nose for the

* While writing this I was called to see a boy, the son of a friend, who swallowed a farthing. It did not reappear for about two days and-a-half, during which time it had not caused the slightest uneasiness. The swallowing of rings on all-hallowed night is a common occurrence.

relief of head-ache. On one occasion a leech that had not been secured as usual by a silk thread, made its way to the back of the throat, and was swallowed, probably when distended with blood. The likelihood is that it died in the stomach, and was subsequently digested by the gastric juice, like any other dead animal substance. Cases are recorded where the individuals have suffered considerably from leeches continuing alive, and causing considerable abstraction of blood from the highly vascular lining membrane of the alimentary canal, to which they are known to take with decided avidity; as is exemplified by the common practice of applying them to the *tousils*—the glands situated at the back of the mouth.

3. *Summary anatomical description of the organs that concur in the function of digestion.*

Since aliments undergo several changes during the process of digestion, it is necessary that a suitable apparatus be provided, the organs of which are adequate to effect the proposed end. In all animals we find that the extent and complexity of those organs increase, in a direct ratio with the dissimilarity of the food to the composition of the animal it is destined to support. Hence, in the carnivorous the apparatus is short and simple—in the herbivorous, long and complicated—in the omnivorous animals, to which class man belongs, it is neither so simple as the former, nor so complicated as the latter.

As we proceed with the description of the organs, we shall briefly consider the functions exercised by each. It would not accord with our purpose, as stated in the introduction, to enter into anything like minute anatomical detail. The organs of digestion (Table IV.) which are engaged in the following operations, are next to be considered: 1. Mastication, or chewing. 2. Deglutition, or swallowing.

3. Digestion in the stomach, or chymification. 4. Digestion in the upper (small) intestine, or chyification. 5. Excretion which takes place in the lower (large) intestine.

1. *Organs of Mastication.* The cavity called mouth, in which the food is chewed, is formed above by the palate and upper jaw; below, by the tongue and lower jaw; on the sides, by the cheeks; in front, by the lips; behind, it is open, and leads into a conical sac named pharynx, which latter tapers into the cylindrical tube called gullet.

In giving a general idea of the anatomy of the mouth, we have to glance at first the hard parts that enter into its formation, and secondly, the soft parts. To the former belong the upper and lower jaws, with the teeth; to the latter, the mucous or lining membrane, the muscles, the glands, the tongue. The division or comminution of the food is effected by the teeth, which are thirty-two in number—sixteen in each jaw, and in man they are divided into three kinds—cutting, tearing, and grinding. Observation of the teeth and motions of the lower jaw of man, would lead us at once to determine, that he belongs to the class of omnivorous animals, or those feeding on both animal and vegetable food; for the lower jaw can be moved upwards, from side to side, and forwards, effecting by the teeth the direct division, the laceration, and the bruising of the solid aliment.

We find here an example of what is so commonly observable, that anatomy or structure leads of necessity to the knowledge of function; for it is obvious that, as nature creates nothing in vain, the peculiar structure must be destined for a specific purpose. This may be still further illustrated by referring to the purely carnivorous and purely herbivorous animals. In the former, the

exclusively hinge-like motion at the articulation of the lower jaw, and the development of the canine or tearing teeth; in the latter, the free motion of this part from side to side, and the full formation of the molar or bruising teeth, at once indicate the habits of the animals respecting their food.

We shall reserve the further consideration of the physiology of the teeth for the subject of dentition and ossification, the periods of growth. (Table IV.) During the process of chewing, the tongue and muscles of the cheeks and lips preserve the food by their pressure between the teeth. The muscles, we may here observe, which are subjacent to the mucous or lining membrane of the alimentary canal, may be divided into three kinds with reference to function. In the mouth, cheeks, lips, and tongue, we have voluntary muscles; in the pharynx (upper portion of gullet) they are mixed; through the remainder of the canal they are involuntary; until we arrive at the termination of the intestine, where we find all three, namely, involuntary, voluntary, and mixed. During the process of mastication, the admixture of saliva and mucus with the food takes place; the latter is derived from the membrane that lines the mouth, and from glands situated in the lips, cheeks, tongue, and palate, which are named accordingly, from the situations they occupy; while the former is obtained from six salivary glands—three on each side—which are also named from their position.

1. The *parotid*, situated between the ear and lower jaw, sends its secretion into the mouth by a duct or tube crossing the cheek, which, from its exposed position, is not infrequently wounded, giving rise to a disfiguring and troublesome disease, to which we shall have presently to allude.

2 & 3. *Submaxillary* and *sublingual* glands placed under the lower jaw and tongue, pour their saliva into the mouth by canals or ducts, which open under the latter organ.

The tongue is an agent of considerable importance in the locomotive apparatus, performing so essential an office at the outset of that great internal function—assimilation—and also being the prime agent in our communications with the external world. The parts of this active muscular organ are symmetrical on each side of its middle line : supplied by six nerves—three on either side—presiding over distinct functions, one for motion, a second for touch, a third for taste. The popular notion that taste resides in the palate, may be readily refuted by applying sugar or salt to this part, when the absence of any decided flavour will soon convince, that this situation is not the seat of the sense. When sapid bodies are applied to the tongue, the latter is pressed against the hard palate, in order that the particles of the former may be forced against the papillæ of the tongue, upon which the sensitive nerves—those of taste—terminate.

The muscles, arteries, (nutrient vessels,) and nerves, are so distinct in the lateral halves of the tongue, that partial or complete loss of motion and taste may occur at one side, while these functions continue perfect on the opposite side.

The effects produced upon this organ and its neighbour, the nose, by an ordinary cold, prove how much taste and smell are influenced by the condition of the lining membrane in both these quarters.

The indications afforded by the varied appearances of the tongue in the protean disease of dyspepsy, are but the sympathies of this part with the derangements consequent upon indigestion.

It is plain that the freedom of motion given to the lower jaw—the powerful muscles destined to move it—the thirty-two teeth found in the jaws—all indicate the intention of nature that the solid food should undergo division and comminution in a perfect manner, before it was transferred to the stomach. We have before remarked (page 44) that Providence links pleasure or enjoyment with those functions which are indispensable in the animal economy. The gratification of the sense of taste is the inducement afforded for prolonged mastication—the more urgent the wants of the system—indicated by hunger—the greater enjoyment does this sense afford. “Hunger” is truly said “to be the best sauce.” The mixture of saliva with the food is essential to healthy digestion, in salivary fistula from injury of the parotid duct, where the secretion of but one gland out of the six is lost, the individual suffers soon from emaciation, owing to imperfect digestion. This goes to disprove the opinion of Dr. Beaumont, who concludes that mastication and insalivation are not essential as preparatory to digestion in the stomach.* It was at one time supposed, as the salivary glands are placed in situations where they are subjected to much motion and pressure, that their secretions were poured forth owing to these causes; but we are all conscious of the influence produced upon these organs by the grateful odour of roast beef—although our jaws are at rest—when, in popular parlance, our *teeth* are said “to water,” in anticipation of the savoury morsel. You have no doubt witnessed the tantalizing trick of holding a piece of meat at an *unattainable* height, to a

* The late Dr. Ballie was called to a patient who had been seized with a fit of vomiting. On inspecting the ejected contents, he observed that it was “no wonder that the stomach should rebel, when but half-chewed food was attempted to be imposed upon it.”

dog, whose weeping mouth has exhibited all the time a stream of wasted saliva. Surely we need not say a single word more to prove, ~~that~~ saliva was intended to be mixed with our food, and that nature would not have ordained it so unless it were necessary.

Now, when we labour under a cold, if we attempt to cure it by a well known remedy, "starvation," we do not feel this a difficult task, because, in consequence of the cold, we have deficient appetite; and besides, to eat, would be an ungrateful task, because the sense of taste is suspended or impaired. What a lesson we should learn from this admirable sympathetic provision, both in health and disease! In the former, where the wants of the system require a supply, the gratification derived by taste from mastication is considerable, while, in the latter, the deranged condition of the system—contra-indicating supply—is accompanied with a corresponding distaste for food.

Some animals swallow their food first, and subsequently divide it. The observation of the gizzard of birds apparently afforded the mechanical physiologists (comparing the stomach to a mill) an argument in favour of their notions respecting digestion; but this agent is to be considered as a mere substitute for the masticating organs found in Mammalia. "The gallinaceous birds, in which the gizzard is most powerful, swallow pebbles* and other hard bodies, which serve the purpose of reducing their food like the gastric teeth of crustacea, insects and gasteropods; (Table III. ;) but in the carnivorous birds, with a thin membranous gizzard, no such substances are required, all the necessary changes being effected by the activity of the gastric

* Hunter found upwards of a thousand pebbles in the gizzard of a goose.

secretions. The parietes (muscular sides) of this organ are subservient, in a remarkable manner, to a known law to which the whole muscular system yields, that of increasing its growth in proportion to the functions imposed on it; this was strikingly illustrated in the case of a sea-gull which Mr. Hunter kept for a year, living contrary to its nature, upon grain. At the end of that period he contrasted its gizzard with that of another sea-gull which had been living on fish, and found that the digastric muscles of the former had acquired nearly three times the development of the latter. He accomplished similar phenomena by changing the food of an eagle and of a tame kite; the former thrived very well on bread, but that it was dissatisfied with its fare is to be inferred, from its seizing the earliest opportunity of breaking its chain and effecting its escape. These facts show in a clear manner the provision of nature for the preservation of life under a variety of circumstances." (*Evers' Comp. Anatomy*, p. 112.)

We may here add that the escape of the eagle also proves, that we should be slow in trusting* any animal, when we seek to turn it from its *natural* habits and propensities. Again, none of us desire to be held by the leg, for "slavery is a bitter draught," more especially for those who, like the eagle, have been once taught to soar.

We shall add one fact more from comparative anatomy, to show how necessary it is that the process of mastication shall be duly performed before the food is submitted to the action of the stomach. Horses that eat their oats greedily bolt them before they are sufficiently chewed. These

* Hence cats are not, generally, confided in as pets—dogs are; or as the proverb has it, "What is bred in the bone cannot be got out of the flesh." Hear the menagery man! "This is the indomitable hyæna, what never can be tamed." "It is a common but erroneous idea, that the hyæna is wholly savage and untameable." (*Buffon*.) Yes,—may be tamed, but not trusted.

animals are kept in condition with difficulty : they are called bad feeders, because the corn, while unbroken, will not yield to the agency of the gastric juice, and is often observed growing after it has been ejected. For such animals we bruise the corn, or we mix salt (which they relish very much) with the oats, in order to bribe them, by eating for their palate, into a prolonged mastication of their food.

It is unnecessary to point to the practical application of these facts in reference to ourselves. The improved health and good condition of the horse, under the foregoing treatment, proves sufficiently that man should profit by the due and proper exercise of his masticating organs.

We come next to consider the act of *deglutition*. Magendie divides this process into three stages : 1st, the passage of the food or alimentary bolus from the mouth into the pharynx ; 2nd, from the latter into the gullet ; 3rd, from the gullet into the stomach. The opening through which the food is transmitted from the mouth into the pharynx, is furnished above with a pendulous fold of mucous membrane attached to the hard palate, having interposed between its layers several muscles, which can elevate, depress, and render tense this valvular production called the soft palate. In the middle of its free margin is a conical appendix, the *uvula*, which is merely small mucous glands, and muscular fibres, included in this prolongation of the lining membrane ; this is the soft fleshy pendulous production which is seen by depressing the tongue, and which becomes so troublesome when elongated by disease. From each side of the soft palate, folds of mucous or lining membrane descend—one to the tongue, the other to the pharynx ; in the triangular interval between these folds a congeries of mucous glands, named the tonsil or amygdala (like an almond) are situated. We have alluded

to the foregoing particularly, because when an individual labours under inflammatory sore throat, these are the parts that are usually affected. In ordinary, the secretion from these and the palatine glands lubricates the mucous membrane, and serves to facilitate the passage of the food from the mouth into the pharynx. The cavity of the mouth, and the parts we have just described, are all covered by a mucous coat, which, from extending throughout the alimentary canal and air passages, is named the gastro-pulmonary mucous membrane. It is continuous with the skin, both at the commencement and at the termination of the digestive tube. The musculo-membranous sac, into which the opening from the mouth leads, is named the pharynx; it is situated in front of the spine, behind the nose, mouth, and air tube, (larynx,) its smaller extremity being continuous with the gullet or œsophagus. Seven openings occur here: four above the soft palate, and three below it; the former are the two posterior openings of the nose through which the respired air passes when the mouth is closed; and the other two are the openings of the eustachian tubes, trumpet-shaped canals, that convey air into the middle cavity of the ear, in order to antagonise the pressure of the atmosphere sustained by the drum of the ear. The three latter openings are the passages into the mouth, air tube and gullet. Since there are then six openings communicating with that of the mouth, it is obvious there must be a provision made to prevent the food from entering any of them but that which leads to the stomach. We have purposely entered into somewhat of anatomical detail, in order to demonstrate the admirable and adequate adaptation of all the parts to the end in view. We shall briefly explain how this first stage of deglution takes place: as the alimentary bolus passes from the mouth into the pharynx,

the valvular fold of mucous membrane—soft palate—is raised so as to protect the four openings above this part; at the same instant the air tube (larynx) is brought upwards and forwards, so that the epiglottis, an elastic lid, is thrown over its aperture, and thus effectually secures it : next, the muscular structure beneath the lining membrane of pharynx and gullet, contracts uniformly from above downwards, and thus propels the morsel through a long musculo-membranous tube, which terminates in the stomach. The descent of aliments is not effected by gravity only, for man can swallow when standing upon his head, or he can drink out of a well like a horse or a cow ; in these animals we can plainly observe when they are drinking, that the fluid passes like a ball through the gullet, contrary to gravity. A considerable quantity of mucus is poured forth upon the lining membrane, which must facilitate the descent of solid aliments ; but if we eat much of any dry food, such as bread, and more especially when we eat quickly, the mucus is not reproduced sufficiently fast so as to lubricate the passage, and, consequently, should we continue to eat, we must have recourse to some fluid as a substitute for the natural secretion.

Abdominal Organs. The alimentary canal is one continuous tube from the mouth downwards to its termination, which varies in its diameter as follows : expanded at the mouth and pharynx ; contracted as œsophagus or gullet ; again expanded into stomach ; next contracted into a long cylindrical tube, which finally terminates in a shorter and larger portion ; the former called small or upper, the latter large or lower intestine. The lining membrane, the most internal coat, is continuous with the skin, both at the commencement and termination of this long canal. Immediately external to this mucous membrane the mus-

cular coat is found, which, being the active agent of locomotion, is indispensable, as the contents must be propelled from above downwards. From the stomach to the termination of the intestines an additional coat is added, called serous, which is a smooth shining membrane, constantly bedewed with a halitus or vapour, which causes all the organs to glide freely upon each other. These coats, more especially the lining membrane, are well supplied with blood-vessels and nerves throughout: two large nerves pass from the brain to be distributed to the stomach and lungs, and hence they are called pneumo-gastric. Besides these nerves, which must obviously link in sympathy the brain, lungs and stomach, there are others which belong to what are called the sympathetic system, and are the nerves of organic or vegetative life, of which we shall have to treat when on the sensitive functions. The great centre of this system (called solar plexus) is situated opposite the pit of the stomach.* Here then is the sensorium of organic—vegetative life, or of the *involuntary* nerves; while the brain is the sensorium of animal—relative life, or of the voluntary nerves. (Page 41, 42.)

The whole tract called alimentary canal, is the primary portion of the organs of digestion, while the secondary or tributary, are the salivary and mucous glands, liver, pancreas and spleen. Now we shall inflict as little as possible, in the way of anatomical description, upon our “gentle” readers concerning these organs.

It will be necessary to inform the waste-squeezers of both sexes, that nature has packed all these organs into a cavity (abdominal) whose walls are elastic, and which should constantly undergo changes of dimensions produced

* A blow here has frequently proved as suddenly fatal as concussion of the brain.

by the function of respiration, as well as occasional changes caused by the degree of distension of the contained organs, for example,—after an ordinary meal.

We will say just a word to convince them. The chest is separated from the abdominal cavity by a muscular partition called diaphragm,* which, when we *inspire*, contracts, and, by descending, pushes the abdominal organs downwards and forwards, thereby distending the muscular walls of the lower cavity; these, in their turn, contract and push upwards and backwards the displaced organs to their former position, which will consequently cause the diaphragm to re-ascend into the chest, and produce *expiration*. Now any one can convince himself of this fact by laying his hand on the abdomen, when he will observe that it will be obviously raised during inspiration and depressed in expiration.

The Stomach. The shape of this organ in man is not inaptly compared to the pouch of a bag-pipe, or to a hunters' horn, consequently it is like a cone bent on itself; the wide portion of it is to the left side, into which the gullet, after passing through the diaphragm, conveys the food; this orifice, being near the heart, is named cardiac; (*Καρ heart*;) the narrow part is to the right side, and terminates in the first intestine, called duodenum; the intestinal orifice gets the name of pylorus or pyloric,† from its supposed watchfulness in preventing, as a trusty sentinel, the passage of undigested aliment into the duodenum; but the history of the knife-swallower (p. 57) proves that this porter is—like some of his brother functionaries in our upper world—not always to be relied upon. Well, we have now the bag consisting of an inner coat to secrete a juice which is to digest the food; a middle, muscular coat, to propel the contents

* Διαφραγμα, a partition.

† Πύλη porta; Ουρος custos; that is to say, a porter.

onward into the intestine, and an external serous membrane to facilitate its motion.

With so much of anatomical knowledge of its parts, let us next look to the functions of this wonderful bag.

Mr. Hunter, in one of his lectures, said : “ Some physiologists will have it that the stomach is a mill ; others, that it is a fermenting vat ; others, again, that it is a stew-pan ; but in my view of the matter it is neither a mill, a fermenting vat, nor a stew-pan—but a *stomach*, gentlemen, a *stomach*.”

In other words, physiologists from time to time erroneously conceived, that the process which the food underwent in the stomach was trituration, fermentation, concoction ; to which we may add maceration and putrification. It is unnecessary to detain you with a refutation of these false and exploded theories of digestion.

It was to the indefatigable and successful labours and conclusive experiments of Spallanzani, that we owe the knowledge of the now admitted fact, that the gastric juice, a peculiar fluid secreted by the stomach, is the chief agent in producing those important changes in the food, known by the name of chymification.

The influence of the nervous system over this function, as well as the share the muscular action of the stomach itself has upon its contents, we shall have occasion presently to consider.

Before we come to speak of digestion, we shall refer to some important facts that have been reduced to such a state of confirmation, as to render them data or principles, upon which we can rely ; and from which we can, by induction, deduce the most legitimate and valuable conclusions. These inferences have been drawn by Dr. Beaumont, of the American army, from a most strict and prolonged

observation of the case of Alexis St. Martin, a young Canadian, of eighteen years of age, good constitution and robust health, who, in consequence of an accidental gunshot injury, laboured under a fistulous opening into the stomach, but with the perfect restoration of the digestive process and all the other functions of the body.

We shall select such of these inferences as appear most suitable for our object.

Results and inferences from Dr. Beaumont's experiments and observations. 1. That the agent of chymification is the gastric juice. 2. That when pure it is fluid, clear, transparent, without odour, a little salt, and perceptibly acid. (muriatic.) 3. That it is never found free in the stomach, but is discharged on the introduction of food or other irritants. 4. It is secreted by the vessels of the stomach. 5. When pure it is capable of being kept for months, and perhaps for years. 6. That it coagulates albumen (white of egg for example) and afterwards dissolves it. 7. Checks the progress of putrefaction. 8. That it acts as a solvent of food, and alters its properties. 9. That it is capable of combining with a certain and fixed *quantity* of food; and when more aliment is presented for its action than it will dissolve, disturbance of the stomach or "indigestion" will ensue. 10. That its action is facilitated by the warmth and motions of the stomach. 11. That the motions of the stomach produce a constant *churning* of its contents, and *admixture* of food and gastric juice. 12. That *no other* fluid produces the same effect on food that gastric juice does, and that it is the *only solvent of aliment*. 13. That the action of the stomach and its fluids is the same on *all kinds* of diet. 14. That *solid* food of a certain texture is easier of digestion than *fluid*. 15. The *animal* and *farinaceous* aliments are more easy of digestion than

vegetable. 16. That the susceptibility of digestion does not, however, depend altogether upon natural or chemical distinctions. 17. That digestion is facilitated by *minuteness of division* and *tenderness of fibre*, and retarded by opposite qualities. 18. That the ultimate principles of aliment are always the same, from whatever food they may be obtained. 19. That stimulating condiments are injurious to the healthy stomach. 20. That the use of *ardent spirits always* produces disease of the stomach if persevered in. 21. That water, ardent spirits, and most other fluids are not affected by the gastric juice, but pass from the stomach soon after they have been received. 22. That the *quantity* of food generally taken is more than the wants of the system require; and that such excess, if persevered in, generally produces not only functional aberration, but disease of the coats of the stomach. 23. That *bulk* as well as *nutriment* is necessary to the articles of diet. 24. That oily food is difficult of digestion, though it contains a large proportion of the nutrient principles. 25. That the digestibility of aliment does not depend upon the quantity of nutrient principles that it contains. 26. That the natural temperature of the stomach is about one hundred Fahrenheit. 27. That exercise elevates the temperature, and that sleep or rest, in a recumbent position, depresses it. 28. That *gentle exercise* facilitates the digestion of food. 29. That the time required for that purpose is various, depending upon the quantity and quality of the food, state of the stomach, &c.; but that the time ordinarily required, for the disposal of a moderate meal of the fibrous parts of meat with bread, &c., is from three to three-and-a-half hours.

Now, we shall proceed presently to refer frequently to the foregoing inferences as text; for, they have been, we may

St. Martin

say, proved, or, at least, deduced as legitimately as the nature of the process of digestion will admit. The case of St. Martin is one of the greatest possible importance in a physiological point of view ; because, this individual was in perfect health, and the size of the opening into the stomach afforded an almost immediate insight or inspection of the functions of this organ. Again, the experiments were of such a nature as not to place St. Martin under unnatural circumstances ; for they were unattended with suffering. It is, we may add, not at all legitimate to find physiologists bringing forward inferences respecting the natural and healthy functions, when we are told that the animals are in very many instances headless, heartless, or stomachless, during the experiments from which these deductions are drawn. We might, with as much justice, come to conclusions respecting the colour of a man's face in ordinary, from observing the blanched appearance which is presented under the impression of terror, on the one hand, or the flushed condition induced by excitement on the other. It has been proved beyond a shadow of doubt, that the gastric juice is the agent employed by nature for producing that decomposition of the food which we call chymification, or digestion in the stomach. How admirably distinct and yet connected are all the works of the Creator ! How separate in nature the organised and inorganised kingdoms, by that inexplicable attribute—life. Yet still how linked are the dependencies of one on the other. Animals cannot derive nourishment directly from the inorganic kingdom, while vegetables, although possessing life, can ; the latter become the connecting link ; the crude and innutritive elements, as regards animals, contained in the soil, are all sufficient for the humble wants and development of plants, upon which they thrive and

have their being. Plants now come, in their turn, to support exclusively the class of animals called herbivorous and granivorous ; these, by a complicated apparatus of digestion, elevate the vegetable food so highly, that it now becomes part of themselves : their flesh finally serves as the food of the carnivorous animal, or of the omnivorous, as man. Here we find the chain ceases. Its links are thus arranged : the earth subserves to the plant ; the plant to the lower animal ; the lower animal to the higher.

We have already quoted from Evers's work on Comparative Anatomy, in reference to the gizzard of fowls, proving that as these animals had not perfect organs of mastication, nature substituted this muscular apparatus, which, by its horny surface, is capable of breaking down the hardest and sharpest substances without injury to its own structure ; but this is not digestion,—that process in the common fowl is effected by the same simple agent, gastric juice. Its gullet swells out into an oval pouch, which is called the *crop*, where the food is mixed with mucus and macerated. The part of the œsophagus or gullet, below the crop, and which conveys the contents of the latter into the gizzard, is called *infundibulum*, where the true gastric juice is secreted. Thus we see that in the common fowl, after deglutition, maceration takes place in the crop ; then, an admixture in the infundibulum with gastric juice ; and next the grinding produced by the action of the gizzard. We shall presently see, that the ox and the sheep, which supply man so abundantly with beef and mutton, submit their food to a process very analagous to that exercised by the feathered tribe ; for the former imperfectly divide their food first, then macerate, next ruminate, all preparatory to digestion. The beak of the fowl imperfectly divides its food ; the crop, macerates ; and finally, the gizzard performs a species of rumination,

or more intimate division and bruising; the contents being at the same time mixed with the gastric juice, while the ruminant animal (ox) has, during the second mastication, the alimentary bolus again plentifully supplied with saliva, which we have shown is so essential for perfect chymification.

The description of the digestive apparatus of this tribe of animals is so interesting and so briefly and clearly given by Mr. Evers in his Comparative Anatomy, that we shall beg to transfer it to this place. "The ruminating animals possess four stomachs: the first, *venter magnus* or paunch, receives the crude unmasticated food, while the animal is grazing. When this cavity is filled, the animal retires to rest, and begins to ruminate; the unmasticated food, softened in the paunch, now passes in small portions into the second cavity, called *reticulum*, or honey-comb; from this it passes as a bolus up through the œsophagus to the mouth; where it is thoroughly masticated and insalivated. It is next conducted by the œsophagus to the third stomach, termed *manyplies*,* or omasum, and from thence into the fourth stomach, *abomasum*, or rennet bag. Of these cavities the first is the largest, and the third is the smallest. The three first are lined with cuticle, and the fourth, which is next in capacity to the paunch, is lined with a soft mucous coat, folded in the longitudinal direction. This is the proper digestive stomach, and is analogous to the digestive sac of carnivorous and higher quadrupeds. The fourth stomach of the ruminantia is the first developed; in the earlier periods of life, it is the largest and the only one employed in digestion. The mechanism by which milk is

* This stomach and the second are the tripe known by the names of book and honeycomb.

transmitted directly into the fourth stomach, during the period of suckling is this: the œsophagus enters where the three first cavities approach each other: here it can open directly into the first or second stomach, but instead of terminating there, it is continued in the form of a groove with prominent lips, which admit of being drawn together, so as to form a complete canal, which then constitutes a direct continuation of the œsophagus into the third stomach; but this cavity not having been distended with solid food in the young animal, it merely forms a tube through which the milk passes into the fourth stomach. In the adult animal the same mechanism continues, but here the third cavity, having been already distended, receives the bolus after rumination.

In the ruminants without horns, as the dromedary, the camel, and the lama, a somewhat different, but not less beautiful, mechanism prevails, fitting them to live in the sandy deserts and arid plains they inhabit. In these animals the paunch consists of two compartments, the first of which receives the unmasticated food, from which it is returned to the mouth, moistened by the fluid of the second or cellular compartment. After the cud has been chewed, the food passes along the upper part of the second cavity into the third, and from that to the fourth. When the camel drinks, the water passes directly into the second cavity, and when this is full it flows into the neighbouring cellular compartment of the paunch. In the bullock the three first cavities are lined with cuticle; in the camel it lines only the two first, and terminates just within the orifice of the third, the surface of which has a faint appearance of honey-comb-structure. From the comparative view which has been taken of the stomach of the bullock and camel, it appears that in the bullock there are three cavi-

ties formed for the preparation of the food and one for its digestion. In the camel the two compartments of the first cavity answer the purposes of the two first stomachs of the bullock; the second is employed as a reservoir for water only; the third is so small and simple in its structure, that it is not easy to ascertain its particular office, whilst the fourth is that in which the process of digestion is accomplished." (p. 119. et seq.)

We have now seen that amongst the vegetable-feeders the alimentary canal is long, capacious, and complicated; which at once intimates that the food of these animals requires an elaborate process before the nutritious portion can be eliminated. How plainly does this indicate that vegetable food only, is unsuitable for those whose powers of digestion are weak or defective, while the digestibility of animal food is at once announced, by observing the short, simple, and straight alimentary canal which generally obtains in the carnivorous animals. It is said, that the digestive apparatus of man allies him more to the former than the latter: we find this more especially "in the land of potatoes," where very many are, from the almost exclusive nature of their food, vegetable-feeders.

"Since vegetable food cannot be procured in the unfathomable depths of the sea, we are prepared to meet with a short and simple form of alimentary canal in fishes suited to their predaceous habits. Vegetable substances might even endanger their lives by an evolution of gas, which would render them specifically lighter than the water, and cause them to float upon its surface with the belly upwards." (*Evers's Comp. Anatomy*, p. 103.)

Again, a large abdominal development would tend to retard their progress through the element they inhabit. We shall find in some of the finny tribe (blue shark) a re-

markable contrivance to increase the *surface* of the intestinal canal, by throwing its lining membrane into spiral projecting folds. This admirable provision thus increases the superficies, and retards the contents, without adding to the bulk of the intestine.

Having thus glanced at the comparative anatomy of the digestive apparatus in a few of those animals which are somewhat allied to man, we shall next come to confine our observations more especially to him.

The gastric juice possesses three remarkable qualities— a coagulating, antiputrescent, and solvent power. The effects produced upon milk, as we see when infants reject it, and the making of whey from the rennet bag of the calf— which is its fourth or digestive stomach— are two examples which sufficiently prove this property. Dr. Fordyce found that the most putrid meat, after remaining a short time in the stomach of a dog, became perfectly sweet. The epicure who relishes game most when “high,” appears to have had an intuitive knowledge of the safety with which he might gratify his palate in this particular. The boa-constrictor that gorges itself at distant periods, has a portion only of its prey in the stomach, that part without, soon undergoes decomposition ; but as this proceeds into the stomach, the putrefactive process is at once suspended, and, as in the canine species, it becomes perfectly sweet by the agency of the gastric juice. Experiments as to the solvent power of this agent were made by Reaumur and Spallanzani on pieces of the toughest meats and hardest bones, with the most uniform results. More lately, “Dr. Stevens, of Edinburgh, showed very satisfactorily the action of the gastric juice on various substances, by enclosing those in silver balls, perforated with holes, which were swallowed by an itinerant German, who went about exhibiting the singular power he had acquired of swallowing stones, &c. In one

of these balls, divided by a partition, were enclosed four and-a-half scruples of raw beef, and five scruples of raw fish. In twenty-one hours the beef had lost one and-a-half scruples, and the fish two scruples. In another ball was placed some beef that had been previously chewed, and in thirty-eight hours after it had been swallowed it was found quite empty." We mentioned, when considering the vital properties, (page 25,) that the gastric juice will, when the individual dies, dissolve the very stomach which had secreted the powerful solvent.

It would appear that this remarkable agent is more or less acid, containing free muriatic acid, and sometimes acetic. It has been observed that when the food is chiefly vegetable, that one or both these acids prevail. It is plain that the gastric juice secreted by an herbivorous animal, and that by one exclusively carnivorous, is not likely to possess precisely identical properties.

"Dr. Stevens found that the gastric juice of dogs produced no effect upon vegetables, but easily dissolved flesh, bones, and even ivory, while the same fluid in the sheep or the ox made no impression on beef, mutton, or other animal bodies; but acted energetically on vegetables. How instinctively we seek these substances which are required by the animal economy! Before the discovery of the existence of muriatic acid (spirits of salt) or of acetic acid (vinegar) as a constituent of the gastric juice, how commonly did we combine vinegar with indigestible substances—sallad for example—with the purpose of more readily effecting their digestion. Nature unites with several vegetable substances, more especially fruits, this acid, probably with a view to facilitate the process of the stomach. The knowledge of the fact that a free acid is found in healthy gastric juice, should render us cautious in the indiscriminate use of alkaline substances, such as soda, lime

water, and magnesia; these, by chemically uniting with the free acid, would neutralize its agency; for we are well aware that when there is a redundancy of acid, indicated by heart-burn, that these substances prove useful for the foregoing reason. Those that are prone to this affection are instinctively desirous of avoiding vegetable food, which, from what we have stated, must necessarily increase the tendency to acid secretions; and besides, owing to its imperfect digestion, it runs into fermentation, the result of which is, the extrication of carbonic acid gas (fixed air) and the production of this very acid, the acetic. Thus we find that those circumstances explain fully why such individuals labour under flatulency and heart-burn, and also the reason why they are—as so frequently occurs in children—led instinctively to pick the lime from walls, consume cinders and ashes, in order to neutralize the prevailing excess of acid.

Gastric juice coagulates albumen (white of egg) before it is dissolved by this agent; although heat and the latter both render albumen solid, yet the change effected in each instance may not be identical, for we find some can digest very well an under-done egg, while a hard one would render them dyspeptic. Another very important property possessed by the gastric juice is that of converting the mass—consisting of any given variety of both animal and vegetable food—into one homogeneous pulpy mass, in which we can no longer recognise the separate ingredients or their several qualities.*

* What a blessing it would prove to society, if we could obtain in the moral world an agent analogous to the gastric juice, which would purify to preserve; melt the most obdurate and opposite; and finally, assimilate all into one mass, in which the peculiarities, the prejudices, the passions, and the parties would be all lost in the formation of one homogeneous, harmonious whole, suitable, as in the physical world, for the wants of the body *social*.

It is a remarkable and important fact, established by the experiments of Dr. Beaumont, that the quantity of gastric juice secreted bears relation not to the mass of food received, by the stomach, but to the quantity of aliment required by the system. Hence, if we should eat more than the wants of the body require, we are punished by indigestion supervening, owing to that portion of food which is in excess not being chymified.

From this circumstance it would appear that eating less than what appetite demands, would be erring, if at all, on the safe side, for we find that those who rise from table without fully satisfying their appetite, are, generally speaking, better, and more comfortable in their subsequent sensations, than those who indulge to satiety.* We have before cautioned you against gratifying the palate at the expense of the stomach; therefore plain food is, on account of its not gratifying over-much the palate, that which is least likely to induce us to overload this organ. The rule is, of course, of most value for the valetudinarian; but we have seen, that even the most robust and healthy, should not be unmindful of accurately proportioning the supply to the absolute wants of the system. Dr. Beaumont says, that when we eat, if we narrowly examine our feelings, two sensations may be distinguished: first, that resulting from having taken enough, which may be recognised by the pleasurable sensation of perfect satisfaction, ease and quiescence of mind and body; and that which follows when we have eaten too much, this is indicated by a sense of satiety. The stomach then has been overburthened. Dr. W. Philip says we should eat *slowly*. In this manner the

* The stomach is, when not stifled by the senses, "a faithful monitor, serving to warn us when we are violating those laws which the Creator has prescribed, as necessary to preserve in perfection the animal frame." Hence it is to the body what conscience is to the soul.

gastric juice mixes with the food in a slow but gradual manner, so that hunger is appeased before the stomach is loaded. We are still disposed to adhere to the rule of appeasing hunger *only*, and not *wholly* removing appetite. We need not entertain any serious apprehension of suffering from starvation under such a rule. We fully agree with the Abernethian opinion that we *all* eat too much, and that we also err, almost as often in reference to the quality as the quantity of the food.

We could cite from our own experience several cases where individuals had become, by careful and judicious attention to the quantity and quality of their diet, as remarkable for activity of body and mind after such caution, as they had been previously for the reverse condition of both.*

The well known case of Lewis Cornaro, a Venetian nobleman, which is referred to in Addison's Spectator, v. 3, no. 195, proves sufficiently how small a portion of aliment will suffice to preserve the body in a sound and healthy state. Cornaro wrote a number of works: amongst these was one entitled, "Praises of a Sober Life," which gives the following particulars of himself:

Until he was forty years of age he pursued a course of indulgence, so that he lost his health, and became subject to various diseases, which his physicians were unable to remove. He then acted as his own physician, and tried what abstinence could effect. In a short time he became again healthy, filled several important state offices, and lived until he was nearly a hundred years old. His diet consisted of twelve ounces of solid and fourteen of liquid food per day. When he exceeded these quantities he became feverish.

* Sirach says of frugality: "Sound sleep cometh of moderate eating; he riseth early, and his wit is with him: but the pains of watching, and choler, and pangs of the belly, are with an insatiable man."

We shall have to point out, when on the intellectual faculties, that those who live by the “sweat of the brain,” cannot eat much without impairing their digestive powers. During active digestion, a full determination of blood, as well as a concentration of nervous energy upon the labouring organ, are required; but if impelled by the insatiable desire for literary lore, or by lawless necessity, or by the pursuit of the “bubble reputation,” the brain be incessantly worked, the current is diverted from its legitimate course—the stomach, and dyspepsy, with all its attendant ills and frightful consequences—known by the too familiar names of bilious and nervous complaints—become fastened upon the ill-fated individual.*

We are fond of “old says,” for they are generally established truths, although not tolerated by “ears polite,” and the followers of my Lord Chesterfield.

We would say both from personal experience and otherwise, that the aphorism which states, “after dinner sit a while,” is founded upon just observation. In the first place, should we engage in active exercise immediately after a meal, we divert the nervous and vascular influence

* “A student in divinity, anxious for the success of his school, as well as for the progress of his studies, made the harrassing duties of the former the only relaxation from the latter. After a year he was obliged to give up the school. But two months had expired when he was seized with inflammation of the membranes of the brain, which proved fatal. After death, not only the brain, but most of the other important organs, were found in a highly diseased state.” Dr. Elliotson justly observes: “Any depressing passion deranges the stomach, (see page 50,) but anxiety is a common source of stomach complaints, although the stomach generally bears the whole blame, and is in vain drugged and dieted; or want of exercise, or great mental occupation is regarded as the cause, while the anxiety is overlooked. Pleasurable mental exertion, ‘constant occupation without care,’ must be very excessive to injure the stomach.”

We may inquire, where shall employment be found that is not beset with care and anxiety?

from the stomach to the muscles, which are then the working organs ; and secondly, such motion of the body must tend to interfere with the progression of the food in the uniform manner, prescribed by the laws of this function.

We shall illustrate this by referring to an experiment made by Professor Harwood. He gave two dogs, equal in age, health and appetite, equal quantities of flesh meat. They were pointers. He permitted one to sleep near the fire, with the other he hunted, and after two hours had elapsed both were killed. In the stomach of the dog which had been kept in constant exercise, the food was found undigested and little changed, whilst in the other it had not only been chymified by the stomach, but converted into chyle in the intestines, and was rapidly passing through the absorbent vessels towards the subclavian vein on its way to the heart.

Those who understand the feeding of horses are not desirous of giving them much oats on a journey ; for they are well aware that the function of digestion is but feebly performed, while the animals are in motion. “ White water,”—a farinaceous drink,—is substituted during the day both because it is calculated to meet the want of fluid—owing to so much being then thrown off by the skin—and, as Dr. Beaumont has shown (p. 77) that most fluids are not affected by the gastric juice, but pass off from the stomach soon after they have been received. This is obviously the case in the horse, while drinking, as we may infer from the quantity he can take at a time. The large feed of oats is reserved for night, when the animal may enjoy perfect rest and repose.

It is obvious from what we have stated, and the foregoing conclusive experiment, that in those countries—England and America for example—where the hurried

meal is eaten, nay bolted—by the one with his head all the time intent on the business that preceded and will immediately follow; or, by the other, that is to resume his manual labour after his equally hasty meal, that the vital currents are not permitted to flow uninterruptedly to the stomach; and hence indigestion will be a sort of national disease, consequent upon the all-absorbing notion—*business*, and the pursuit of *money*.*

Dr. Beaumont states that the food undergoes a sort of *churning* during its mixture with the gastric juice, or a circular motion along its curvatures, and that GENTLE exercise facilitates its digestion. (P. 76, 77.) Dr. W. Philip infers from his experiments that the food is digested in concentric layers, and that after the part in contact with the stomach is acted upon by the gastric juice, it is moved uniformly onward to the intestinal orifice; and thus each layer in succession, from the circumference towards the centre, is chymified. In either case, but more especially in the latter, the necessity for abstaining from *labour* or *active* exercise soon after a meal may be certainly inferred. They both agree in concluding that *solid* food of a certain texture is more easily digested than *fluid*; this might at once be inferred from the experiments of Philip, because from the aliment existing in the latter form the successive changes of its parts, could not be regularly effected. It is on this account we recommend dry toast or bread to be broken or crumbled into soup or broth, in order that by absorbing the latter a sort of soft solid may be formed by their union. When patients are convalescent we direct their slops to be thickened, which are chiefly farinaceous,

* "It is not the plenty of meat that nourishes, but a good digestion; neither is it abundance of wealth that makes us happy, but the discreet use of it."

such as gruel, barley, rice, tapioca, and the *so called* arrow root. These substances, as we shall presently proceed to show, are easy of digestion, but the period required in ordinary (p. 77) “for the disposal of a moderate meal of the fibrous parts of meat with bread, &c., is from three to three and-a-half hours.”

It is then strictly in accordance with the vital laws that we should be desirous to postpone the dinner hour until we have dispatched the business and the labours of the day; which will enable us to spend a few leisure hours with those for whom we so willingly work and struggle—to luxuriate in the endless enjoyments of home—“*domus et placens uxor*”—the happy faces and contagious laughter of the light-hearted and buoyant spirits that surround us—the never-ending gambols—the winning ways and innocent prattle that make their way at once to the heart of the husband and the father. No wonder that the old bachelor should be hopelessly dyspeptic, for

“No children run to kiss their sire’s return,
Nor climb his knees the envied kiss to share.”

The following observations with reference to diet afford so much of practical information that we shall quote them at length:

“*Necessity of the variation of diet.*—Magendie’s further experiments on the nutritious property of different substances, establish the following facts: 1. A dog fed on white bread, wheat and water, did not live more than fifty days. 2. Another dog, on the contrary, which was kept on brown soldier’s bread, did not suffer. 3. Rabbits and guinea-pigs fed on any one of the following substances—wheat, oats, barley, cabbage or carrots—died with all the signs of inanition in fifteen days; while, if the same substances were given simultaneously, or in succession, the

animals lived without suffering any ill effect. 4. An ass fed on dry rice, and afterwards on boiled rice, lived only fifteen days. A cock, on the contrary, was fed with boiled rice for several months with no ill consequence. 5. Dogs fed with cheese alone, or with hard eggs, lived for a long time; but they became feeble and thin, and lost their hair. 6. Rodent animals will live a very long time on muscular substance. 7. After an animal has been fed for a long period on one kind of aliment, which, if continued, will not alone support life, allowing him his customary food will not then save him; he will eat eagerly, but he will die as soon as if he had continued to be restricted to the one article of food which was first given. The conclusion to be deduced from the above facts is, that difference and variety of the kinds of aliment is an important circumstance to be attended to in the preservation of health.

Dr. Prout reduces all the articles of nourishment among the higher animals to three classes: 1. The *saccharine*, comprehending sugar, starch, gum, &c.; 2. The *oily*, including oils and fats; and, 3, The *albuminous*—the proximate principles of animals and vegetable gluten. “Observing that milk, the only article actually furnished and intended by nature as food, was essentially composed of three ingredients, viz., saccharine, oily, and curdy or albuminous matter. I was by degrees led to the conclusion that all the alimentary matters employed by man and the more perfect animals might, in fact, be reduced to the same three general heads: hence, I determined to submit them to a rigorous examination in the first place, and ascertain, if possible, their general relations and analogies. An account of the first of these classes, viz., the saccharine matters has been published in the Philosophical Transactions, and the

others are in progress. The characteristic property of saccharine bodies is, that they are composed simply of carbon, united to oxygen and hydrogen, in the proportion in which they form water; the proportion of carbon varying in different instances from about thirty to fifty per cent. The other two families consist of compound bases (of which carbon constitutes the chief element) likewise mixed with, and modified by water, and the proportion of carbon in oily bodies, which stand at the extreme of the scale in this respect, varies from about sixty to eighty per cent. Hence, considering carbon as indicating the degree of nutrition, which in some respects may be fairly done, the oils may be regarded in general as the most nutritious class of bodies. And the general conclusion from the whole is, that substances naturally containing less than thirty, or more than eighty per cent. of carbon, are not well, if at all, adapted for aliment.

It remains to be proved whether animals can live on one of these families exclusively; but at present experiments are decidedly against this assumption, and the most probable view is that a mixture of two at least, if not of all three, of the classes of nutriment is necessary. Thus, as has been stated, milk is a compound of this description, and almost all the gramineous and herbaceous matters employed as food by animals contain at least two of the three—the saccharine, and glutinous or albuminous. The same is true of animal aliments, which consist at least of the albuminous and oleaginous; in short, it is perhaps impossible to name a substance employed by the more perfect animals as food, which does not essentially constitute a natural compound of at least two, if not of all three, of the above three great classes of alimentary matters.

But it is in the artificial food of man that we see this great

principle of mixture most strongly exemplified. He, dissatisfied with the productions spontaneously furnished by nature, culls from every source, and, by the power of his reason, or rather his instinct, forms in every possible manner, and under every disguise, the same great alimentary compound. This, after all his cooking and art, how much soever he may be inclined to disbelieve it, is the sole object of his labour; and the more nearly his results approach to this, the more nearly they approach perfection. Thus, from the earlier times, instinct has taught him to add oil or butter to farinaceous substances, such as bread, which are naturally defective in this principle. The same instinct has taught him to fatten animals, with the view of procuring the oleaginous in conjunction with the albuminous principle, which compound he finally consumes, for the most part in conjunction with saccharine principles, in the form of bread or vegetables. Even in the utmost refinements of his luxury, and in his choicest delicacies, the same great principle is attended to; and his sugar and flour, his eggs and butter, in all their various forms and combinations, are nothing more nor less than disguised imitations of the great alimentary prototype, *milk*, as presented to him by nature."

Bostock says "milk, which from its destination, as the food of the young animal immediately after birth, may be regarded as peculiarly adapted both for digestion and nutrition, consists of an emulsion of albumen, (white of egg,) oil and sugar, suspended in a large quantity of water. In the formation of cheese and butter we abstract the greatest part of the water, and obtain the albumen and oil respectively, in a state of greater or less purity, according to the exact nature of the process which is employed."

Now a very important distinction must ever be kept in

view between those substances which possess much of the proximate principles* above mentioned, and those that are easy of digestion. We have learned from experience that concentrated nourishment is often difficult of assimilation; and we find that Dr. Beaumont's experiments and inferences tend to confirm this view; for he states "that the digestibility of aliment does not depend upon the quantity of nutrient principles that it contains." The stomach appears jealous, as it were, of this excessive interference with its peculiar functions, anticipating its acts by presenting this organ with what *we* esteem the exclusively nutritious portion.

We shall enter a little into detail to illustrate this circumstance. We have seen (p. 31) that the leading element in plants is carbon, (charcoal,) and that they contain *little nitrogen*; while all animals contain a *large* quantity of *nitrogen*. Now, if we have to look for the ultimate element only, we should prefer the exclusive use of animal food, because it possessed so much nitrogen, while the small portion of the latter found in vegetables should induce us to reject them. Experience, however, has proved that, in general, we enjoy the best health when we use a due proportion of both. We have already shown that the masticating apparatus of man fixes him decidedly amongst omni-

* It may not be uncalled for to explain what is meant by *proximate principles* and *ultimate elements*. The former in animal food are fibrin, albumen, (white of egg,) jelly, oil, &c.; in vegetable aliment they are gluten, farina, (starch,) gum, oil and sugar. The latter are discovered by decomposition, and hence this process is called destructive analysis. In animal substances they are oxygen, hydrogen, carbon, and *nitrogen*; the last in *large* quantity. Vegetable substances contain oxygen, hydrogen, and carbon; but the proportion of carbon is generally greater, and of hydrogen less, while for the most part they are either *without nitrogen*, or contain it in small quantity only. (P. 31.)

vorous animals, or those destined to live upon both animal and vegetable food. Some have considered that the alimentary canal of man assimilates him, in regard to the nature of his diet, more to the herbivorous than the carnivorous animals.

There is little doubt that if we were compelled to make a choice of one kind of food to the exclusion of the other, we would be induced to confine ourselves to vegetable, rather than animal aliment.

Dr. Beaumont infers that *bulk*, as well as nutriment, is necessary to the articles of diet. Acting upon this principle, we never think of feeding a horse, for example, exclusively upon oats, without giving him at the same time the more bulky and less nutritive substance—hay, or even straw. The wholesome nature of whole-meal bread may owe this property to the coarse part—bran, &c.—having been left combined with the fine flower; and thus we have the aliment with all its parts more or less nutritive, submitted to the digestive organs.

How contentedly do many of the poor Irish peasantry, from week to week and year to year, make potatoes their *exclusive* diet, for even the animal addition of a little milk or butter is too frequently withheld, not from voluntary abstinence, but owing to poverty—aye, the poverty of utter want and wretchedness; but “God fits the back to the burden, and tempers the wind to the shorn lamb,” or we could not, by possibility, find health, vigour, cheerfulness—nay even contentment, the inhabitants of the mud-built hovel.

The effects produced at sea by the want of vegetables is well known to all. In a troublesome and dangerous disease, diabetes, it becomes necessary to confine patients almost exclusively to animal food; they very soon loathe this diet,

and we are compelled to relinquish or modify the plan of treatment in that respect. I may here mention what has been observed by many, that if coffee be taken as luncheon, the appetite for dinner is considerably lessened. In a conversation with Sir Henry Marsh upon this subject, we mentioned that it might probably result from the fact of this beverage containing so much nitrogen—the almost distinctive ultimate element of animals; “for in *cafein*, a principle extracted from coffee, there is actually a greater quantity of nitrogen than in most animal substances.” It was very remarkable how, on the instant, this learned and acute physician made the inductive reasoning which caused him to say, he would give coffee a trial in diabetes, as a substitute for animal diet.

The object in proscribing, in this case, vegetable food, is to prevent the formation of sugar; for it is well known that the ultimate elements of the former yield those which, by analysis, are found to be identical with the saccharine product of the kidneys. Still we want some *solid* substance—not vegetable—to combine with the coffee. Before the experiments of Beaumont, which proved that *bulk*, as well as nutriment, is necessary in reference to articles of diet, W. Philip stated that “it is not generally known that the most concentrated decoction of beef, so far from affording much nutriment, will not, if unmixed with something *solid*, even allay the calls of hunger. A person under my care was attacked with severe pain of the face, when even the smallest quantity of any solid food was put on the stomach; a single mouthful of bread never failed to bring on the attack; and as he at length refused all solid food, he was confined for some weeks to a strong decoction of beef; but however strong, and in whatever quantity it was taken, it never satisfied the appetite, and he rapidly emaciated.”

LECTURE IV.

KINDS OF FOOD—CONDIMENTS—ARDENT SPIRITS.

From the observations made in the preceding lecture, it will appear that in determining upon the articles of diet conducive to health, we have to hold in recollection that the most nutritive may not be also the most easy of digestion.

Dr. Beaumont states that oily food is difficult of digestion, though it contains *a large* proportion of the *nutrient* principles. (See p. 57.) He also states that bile is not ordinarily found *in the stomach*, and is *not* commonly *necessary* for chymification; but that when oily food has been used, it assists its digestion. In experiments with the gastric juice removed from the stomach, he found “that oily or fatty food is sooner digested when there is a small admixture of bile with gastric juice.”

It would appear from the foregoing, that indigestible substances may be truly said to render the stomach bilious; and it may also be inferred, that owing to the sympathy which exists between the stomach and first intestine, with which it directly communicates, the pyloric orifice will permit the bile to flow into the stomach, and thus aid the gastric juice in digesting the refractory substance. Bichat supposed that bile was found in ordinary in the stomach, and was necessary for digestion; but the observations of Dr. Beaumont go to prove most decidedly, that the presence of this fluid in that organ is to be esteemed as an unhealthy symptom, produced by an inverted action of the duodenum; for we find that the bile duct opens into the most depending portion of this intestine, obviously with a view to prevent the secretion of the liver passing into the stomach.

{ Vomiting also proves this fact, for when it is excited, the first contents ejected are those of the stomach; and subsequently, when the inverted action of the duodenum occurs, as well as that of the stomach, bile is thrown up. So much knowledge should interdict the use of toasted bacon, which has been often prescribed for dyspeptic patients.*

The case of St. Martin has put us in possession of some very important information in reference to the digestibility of the various forms of aliment in ordinary use. We shall therefore proceed at once to direct your attention to the following condensed view of the relative digestibility of different kinds of food according to Dr. Beaumont's experiments:

{ *Of Farinacea.* Rice boiled soft, was perfectly converted into chyme in an hour; sago, in one hour forty-five minutes; tapioca, barley, &c., two hours; bread, fresh, three hours—stale, two hours; sponge cake, two hours thirty minutes.

{ *Of Vegetables.* Cabbage—raw, two hours thirty minutes—boiled, four hours; (vinegar much assisted its digestion;) potatoes roasted, two hours thirty minutes—boiled, three hours thirty minutes; carrots boiled, three hours fifteen minutes; beet boiled, three hours forty-five minutes; turnips boiled, three hours thirty minutes; beans boiled, two hours thirty minutes; parsnips boiled, two hours thirty-one minutes.

Of Fruit. Apples, sour and hard, two hours fifty minutes—mellow, two hours—sweet and ripe, one hour thirty minutes; peach, mellow, one hour thirty minutes.

Of Fish and Shell-fish. Trout, boiled or fried, one hour

* "It is a singular fact, that the fat of bacon toasted like bread before the fire is not oppressive to most dyspeptics." (*Philip.*)

thirty minutes; eod-fish, cured and boiled, two hours; oysters, undressed, two hours fifty-five minutes—roasted, three hours fifteen minutes—stewed, three hours thirty minutes; bass, boiled, three hours; flounder, fried, three hours thirty minutes; salmon, salted and boiled, four hours.

Of Poultry, Game, &c. Turkey, roasted, two hours thirty minutes—boiled, two hours thirty-five minutes; goose, wild, roast, two hours thirty minutes; chicken, friassed, two hours forty-five minutes; fowls, domestic, boiled or roast, four hours; ducks, tame, roast, four hours—wild, roast, four hours thirty minutes.

Of Butchers' Meat, &c. Soused tripe and pigs' feet, fried or boiled, one hour; venison steak, broiled, one hour thirty-five minutes; calf's or lamb's liver, broiled, two hours; sucking pig, two hours thirty minutes; mutton, broiled, three hours—boiled, three hours—roast, three hours fifteen minutes; beef, fresh, broiled, three hours—roasted, three hours—lightly salted and boiled, three hours thirty-six minutes—old, hard, salted, four hours fifteen minutes; pork steak, broiled, three hours fifteen minutes—lately salted and boiled, four hours thirty minutes—stewed, three hours—roast, five hours fifteen minutes; veal, broiled, four hours—fried, four hours thirty minutes.

Varieties. Eggs, raw, two hours—roasted, two hours fifteen minutes—soft-boiled, three hours—hard-boiled or fried, three hours thirty minutes; custard, baked, two hours forty-five minutes; milk, two hours; butter and cheese, three hours thirty minutes; suet, four hours thirty minutes; oil, somewhat longer; apple-dumpling, three hours, while calf's-foot jelly was digested in little more than half an hour.

Dr. Beaumont states, "that stimulating condiments are

injurious to the healthy stomach." The made dishes and the spicy ragouts do harm in two ways, by pleasing the palate at the expense of the stomach, thus inducing us to eat too much; and secondly, by injuriously stimulating the stomach, they produce a corresponding collapse, afterwards; for this is in obedience to a law in the animal economy, which ordains, that if the functions of any organ be elevated beyond par, a corresponding depression will take place after.

A like result would appear to follow equally in the moral, as well as in the physical world; for we find that those with elevated and exuberant spirits, are often run down to a melancholy state of depression after the fit of excitement is over.* It has been said that there is but one step between the sublime and the ridiculous; so also have laughing and crying been esteemed near neighbours.

Bostock makes the following judicious observations respecting condiments. These are very numerous, and derived from very different sources; but they may be all reduced to the two heads of salts and spices. Their selection appears to depend upon very singular habits, or even caprices, so that those substances which are most grateful to certain individuals and classes of people are the most disagreeable, or even nauseous to others. It may be laid down as a general principle that such articles as are in the first instance disagreeable to the palate, are those for which we afterwards acquire the strongest partiality,† and which even become necessary for our comfort; whereas the frequent repetition of flavours that are originally grateful, is very apt to produce a sense of satiety, or even disgust.

* How desirable the happy medium!

"Tho' deep, yet clear; tho' gentle, yet not dull;
Strong, without rage; without o'erflowing, full."

† So of vice. See Pope.

The examples of tobacco, garlic, and assafœtida, on the one hand, and of such substances as possess simple sweetness on the other, may be adduced in proof of this position.

Dr. Paris says, in his Pharmacologia, that that most extraordinary plant tobacco, notwithstanding its powers of fascination, has suffered romantic vicissitudes in its fame and character; it has been successively opposed and condemned by physicians—condemned and eulogised by priests and kings—and proscribed and protected by governments; whilst at length this once insignificant production of a little island, or an obscure district, has succeeded in diffusing itself through every climate, and in subjecting the inhabitants of every country to its dominion. The Arab cultivates it in the burning desert—the Laplander and Esquimaux risk their lives to procure a refreshment so delicious in their wintry solitude—the seaman, grant him but this luxury, and he will endure with cheerfulness every other privation, and defy the fury of the raging elements; and in the higher walks of civilized society, at the shrine of fashion—in the palace and in the cottage—the fascinating influence of this singular plant commands an equal tribute of devotion and attachment. Dr. Paris states in a foot note, that James the First wrote a philippic against this plant, entitled “A COUNTERBLASTE TO TOBACCO,” in which the royal author informs his loving subjects that “it is a custome loathsome to the eye, hateful to the nose, harmful to the braine, dangerous to the lungs; and in the black stinking fume thereof neerer resembling the horrible Stigian smoake of the pit that is bottomlesse.” Well, for our own part, we think the royal author has recorded a most admirable philippic against this vile drug, the relinquishment of which, in the shape of snuff, tobacco, and cigars, we have seen followed by the most salutary results

in aggravated cases of dyspepsy. We have shown before (p. 46) that the narcotic influence of tobacco completely neutralizes the healthy indications of the stomach; and indeed those addicted to its use, or that of snuff, would prefer dispensing with food* rather than be deprived of the NARCOTIC enjoyment—and therefore injurious—of this fascinating drug.

“De gustibus non est disputandum,”

“Concerning taste, there is no disputing,” both in a physical and moral point of view. It is equally proverbial that “what is one man’s meat is another man’s poison;” and all we can ever do in dietetics is to lay down rules for the many—not for the few. But every one will be able to determine, from ordinary observation, those peculiarities as respects himself. “Much may often be ascribed to the effects of habit and accidental association, or even of mere caprice; but upon the whole, we may conclude, that there are original variations in the powers of the stomach, which cannot be accounted for upon any other principle, either moral or physiological.” Certain conditions of the system we have known to produce a most extraordinary effect in this way. The liking and disliking several articles of food just at the period of pregnancy is familiar to us all. Climate and season influence our senses very much in this respect. Paris says, alluding to the influence of climate upon remedies, “can a more striking proof be adduced than the well-known effects of perfumes at Rome? The inhabitants are unable to sustain the strong scent of flowers in that climate, without experiencing a sensation

* Before going to work at six o’clock, A.M., some of the younger men eat a crust of bread; others, less temperate and wise, take either their “morning”—a glass of whiskey, or “a blast of the pipe,” or both, in which they are also joined by the old workmen.

highly oppressive, and which in some cases is even succeeded by syncope, and thus realizing the well-known line of the poet :

“ Die of a rose, in aromatic pain.”

Rose, in his “ Letters from the North of Italy,” describes the Venetian ladies as fainting at the odour of common essences.

Salt may be said to be a universal favourite. We are all acquainted with the recommendations it receives in the sacred Scriptures. How much brute animals relish it! The horse will often eat musty hay, which he previously declined, when this substance is shaken upon it. Those who are familiar with the feeding of these animals are well aware of its salutary operation, improving both their health and condition. Dr. Paris states : “ The effects of salt upon the animal and vegetable kingdoms are striking and important, and have furnished objects of the most interesting inquiry to the physiologist, the chemist, the physician, and the agriculturist : it appears to be a natural stimulant to the digestive organs ; and that animals are instinctively led to immense distances in pursuit of it. Salt, when taken in moderate quantities, promotes, while, in excessive ones, it prevents, digestion ; it is therefore tonic and anthelmintic,* correcting that disordered state of the bowels which favours the propagation of worms. In Ireland, where, from the bad quality of the food, the lower classes are greatly infested with worms, a draught of salt and water is a popular and efficacious anthelmintic.”

We have before (p. 96) referred to some of the Irish peasantry as being specimens of vegetable-feeders, in the exclu-

* That which kills worms.

sive sense of this appellation. We may here add, that when they cannot procure milk—even buttermilk—they dissolve salt in water, into which they dip the potatoe before eating it. This solution is called by an Irish name, which signifies “blind herring.” The salt thus taken counteracts the tendency to worms, which would be produced owing to potatoes forming their exclusive aliment. Several worm cases have been cured by this remedy, after other treatment had failed. Mr. Marshall has published a successful case, which was that of a lady who had a natural antipathy to salt, and was in consequence most dreadfully infested with worms during her whole life. Dr. Paris states that “the government of France appears to have been as impolitic with regard to the tax on salt as the English. Buonaparte abolished the collection of turn-pike dues, and imposed a tax on salt, payable at the salt-pans, in its stead. It is not, perhaps, generally known that by the aid of this tax, he was enabled to complete the grand entrance into Italy, over the Simplon; so that it may be fairly observed, that if Hanibal was enabled to cross the Alps by the aid of VINEGAR, Buonaparte, by the assistance of SALT, succeeded in constructing a public road over the same mountains.”

The observations made with reference to stimulating condiments—spices—are also applicable to the use of ardent spirits, which Beaumont mentions produces disease of the stomach if persevered in.

Bostock states, that though distilled spirits are occasionally valuable, as medical agents, they must be always more or less pernicious when made habitual articles of diet.

For pen or pencil to attempt to pourtray all the misery, disease and depravity that have followed from inebriation, and its consequences, would, indeed, be a presumptuous piece of pretension. What deeds of the deepest dye have

been hatched and perpetrated in our distracted country under the hellish excitation of whiskey—the curse of Ireland, the ruthless destroyer of soul and body, the legalized engine of the foul fiend by whose maddening influence he incites to crimes* “that make the angels weep,” casting by their direful consequences upon a cold and unpitying world the homeless, houseless, heart-broken widowed mother and her destitute offspring.

It is the duty, the imperative duty of the medical practitioner, to set his face against that which he knows to be injurious both to the physical and moral being of his patients. You should not be persuaded to give your sanction to what is called the “temperate use” of ardent spirits. Beaumont’s experiments have proved that any portion of it excites, preternaturally excites the stomach, and lays the foundation of disease—organic disease. We cannot serve God and Mammon. We must not permit those around us to *drink* because they tell us they are never

* “In the late murder of Mr. Lenard, which took place between Ross and Waterford, when sentence of death was pronounced on Malone, the murderer, he said to the judge, ‘Yes, my lord, I am guilty; but,’ pointing to his *mother*, who was in the same dock, he said, ‘she has been the cause of it.’ It appears that his monster of a parent had agreed for the price of the blood to be shed by her two sons, for there were two implicated; and though above *eighty years* of age, she watched the approach of the unfortunate gentleman, and handed the pistol to her son when she saw the former coming. Malone at first was startled, and said ‘How can I murder the poor gentleman!’ ‘Take this, you cowardly rascal,’ said the old woman, and gave him the remains of a half pint of whiskey obtained for the occasion. He drank the whiskey, murdered the gentleman, and was tried and hanged. It must not be forgotten that this young man was known to have been one of the kindest-hearted fellows in the country, except when under the influence of strong drink.” (Parliamentary Report, p. 229.) See also Anti-Bacchus, for the crimes, diseases, and other evils connected with the use of intoxicating drinks.

inebriated. We know they are on the very verge of a frightful precipice ; they must—they shall fly from the demoralizing pestilence, *drinking*, which besots and brutalizes not only its devoted victims, but also spreads around a moral contagion, which blights and blasts everything within its noxious and withering influence. The great and regenerating apostle of temperance, the revered and reverend Mathew, has effected more for Ireland than St. Patriek, the fabled banisher of snakes and vipers ; for these reptiles could destroy the body only ; but whiskey, so much to be feared, destroys both soul and body. Let not the example of self-control and abstinence set by the humbler classes of society chiefly, be lost on the higher and middle orders. Let all grades,* all parties, all sects, merge their differences in these respects, and conspire in this common cause ; upon the merits of which there can be no difference of opinion, as the cultivation of temperance is the pursuit of virtue, and consequently of happiness—"our being, end, and aim."

Beaumont states that when St. Martin drank *fermented* liquors, (which always contain a certain portion of spirits,) "the mucous membrane of the stomach was covered with *inflammatory* and *ulcerous* patches, the *secretions were vitiated*, and the *gastric juice diminished*, and of unnatural viscidty, and yet he described himself as perfectly well, and free from uneasiness. *Two days subsequent* to this, the inner membrane of the stomach was *unusually* morbid, the *inflammatory appearance more extensive*, the spots more livid than usual : from the surface of some of them exuded *small drops of grumous blood* : the *ulcerous patches were larger and more numerous* ; the mucous covering

* "It is not for kings to drink wine, nor princes strong drink."—We trust *our* young prince will be, indeed, "the *prince*" of teetotallers.

thicker than usual, and the gastric secretions much more vitiated. The gastric fluids extracted were mixed with a large proportion of thick ropy mucous, and a considerable *muco-purulent discharge*, slightly tinged with blood, resembling discharges from the bowels, in some cases of dysentery.* Notwithstanding this diseased appearance of the stomach, no very essential aberration of its functions was manifested. St. Martin did not complain of symptoms indicating any general derangement of the system, except *an uneasy sensation and tenderness at the pit of the stomach, and some vertigo, with dimness and yellowness of vision on stooping down and rising up again.* Dr. Beaumont further observed, that “the free use of *ardent spirits, wine, beer, or any other intoxicating liquor*, when continued for some days, *has invariably produced these changes.*”

In reference to the use of ardent spirits, &c., we may add to the testimony of Beaumont—an eye witness of the foregoing morbid changes—that of the late Sir A. Cooper, who spoke thus: “No person has a greater hostility to dram-drinking than myself, insomuch that I never suffer any ardent spirits in my house, thinking them *evil spirits*; and if the poor could witness the white livers, the dropsies, the shattered nervous systems which I have seen as the consequences of drinking, they would be aware that spirits and *poisons* are synonymous terms.” A testimony similar in sentiment was signed by nearly *five hundred* medical men

* It is plain that inflammatory action of the lining membrane supervened upon the taking of fermented liquors, and that the usual effects of this morbid change followed, altering the healthy secretions of the stomach, and producing ulceration of its coats, and the formation of muco-purulent matter mixed with blood, similar to that formed upon the lining membrane of the nose, as a consequence of inflammation of this structure produced by an ordinary cold.

of the first respectability in Great Britain and Ireland. In the Parliamentary Report on drunkenness, Dr. Dods states, that "diseases of the brain, of the liver, of the heart and bloodvessels, of the kidneys, of the stomach, of the pancreas, of the bladder, of the skin; that apoplexy, insanity, mental delusions and delirium tremens, all sprung from the use of alcoholic drinks. Mental dejection, morbid irritability, ungovernable passion, frightful delusions, confirmed insanity, aneurism; and the perpetration of the foulest crimes, as duelling, murder, suicide, &c., the same physician attributes to strong drinks as their origin."

We must all acknowledge the truth of the following. "Well has it been said that 'intoxicating drinks have visited the earth with a second curse;' and on none has it alighted with such tremendous fury as on the unhappy wives of tipplers. The history of these broken-hearted women, like Ezekiel's roll, is written within with 'lamentations, and weeping, and woe.' Compelled day after day to toil for an infant family, to subsist on the coarsest and scantiest food, to hear her children cry for bread, without having any to give them, to be herself and her children clothed in rags, with neither bed nor furniture to repose on or give comfort to her family: to have to endure all this, while the husband is spending in the ale-house what might make all of them comfortable, is to the mother a bitter cup of affliction, and to the father a crime of no ordinary magnitude."

We witnessed a long time since, when a student at the profession, a case which but too strongly illustrates the truth of all the foregoing remarks. I shall briefly relate the particulars.

About twenty years ago, a man in a fainting condition was borne on a door into Jervis-street hospital. On removing his clothes, which were steeped in blood, a large and

gaping wound of the side was disclosed, through which a portion of collapsed intestine had protruded.

This injury was inflicted by a fellow tradesman, a shoe-maker, in an adjoining *public-house*, while both were in a state of *intoxication*, with a long and sharp pointed knife which is used in their craft.

The inflammation that supervened baffled all attempts—the patient sunk after a short time. The post mortem examination disclosed wounds of the liver, intestine, and gall bladder, followed by such extravasation of the contents of the latter, as rendered the case hopeless, or without the pale of our art. I shall never forget the impression which that scene left upon my recollection, then a tyro at the profession. The wife stood at the bedside of the wounded husband, “with anxious eye and aching ear,” while the attendants removed the clothes saturated with gore: *there* the woman stood, literally rivetted to the spot—she spoke not—her hands clasped with convulsive agony upon her breast—her head drooped—“with the paleness of death upon her cheek, and more than its agonies in her heart.”

How the victim of *drunkenness* and treachery must have felt during that sad scene of sorrow! The struggle with mute and passive grief was of short duration. The energies of woman were roused—his ministering angel was at hand: never did I behold such devoted and tender attention as was bestowed upon this unfortunate patient by his kind and attached wife; not a single reproach escaped her lips—night and day she never once left his bedside, except to minister to his wants.

But two days had elapsed after the death of the ill-fated shoe-maker, when his unfortunate widow was borne into the hospital, screaming with agony. The history of the interval is brief. The poor woman, and her five helpless chil-

dren, had been driven from their comfortless room—named *home*, by an inexorable brute of a landlord, and were forced to seek a shelter in a wretched and damp cellar, on a bed of straw. The cup of misery was filled—human nature had endured its uttermost, and at length was overcome. Death, destitution, and despair had felled its almost devoted victim to the earth. Peritonitis—inflammation of the membrane surrounding the abdominal organs—had supervened in its most acute and intense character.

To form an adequate idea of the sufferings of a patient in this disease, you must witness their agonies.

I was directed by my respected friend, Dr. O'Bierne, with whose name science is so familiar, to bleed this patient immediately from both arms. Upwards of *forty* ounces of blood were abstracted in a few minutes : the relief obtained was instantaneous ; it was like the work of magic.

Perspiration and sleep suddenly and simultaneously supervened ; this secretion actually rolled in a palpable stream off the skin : never have I beheld a more copious diaphoresis, or a more complete removal of agonizing suffering, than was afforded in this case, which we may cite as one of the most striking triumphs of the “healing art” over disease.

No other remedy was used or required to remove this poor woman’s sufferings but the lancet. Its judicious employment was followed by relief and recovery as rapid as it was remarkable.

Now we would ask, should those who have reflected upon and compared these two cases of peritonitis, condemn our art, abundantly successful in the case of the wife, but unsuccessful in that of the husband, obviously because the nature of the injury inflicted in *his* case was of *itself fatal*?

We think, after the foregoing case, that you will be out of all patience with “*one*” Dr. Dickson, of Imperial-square,

Cheltenham, who lately, in defence of his "Principles of Practice of Physic," states in the "*Lancet*"—a very unsuitable vehicle, I should think, for such stuff—"It is now some years since I first repudiated the *Lancet* as therapeutic agent; an instrument invented in an age of barbarism; the first and only resource of ignorant pretension in almost every ease and country."

There, gentlemen, is an unlimited and sweeping exclusion of one of our most useful remedies! No wonder the public should be sceptical, when such trash is published by one yeleft a *Doctor*!

It was justly observed, that *true** religion has been at all times, and in all ages, greatly injured by *pretenders*. The same remark holds good in reference to the practice of physic.

Berkely, the celebrated immaterialist, (one who says there is no such thing as matter in the world,) the amiable bishop of far-water notoriety, one day knocked loudly at Swift's hall door. The witty dean ordered his servants not to open the door, thrust his head out of the window, and cried out to Berkely, "Why don't you come in out of the rain?—can't you come through the door?—sure there's no such thing in nature as matter!"

"God between this Cheltenham *Doctor* and all harm," (as we say in Ireland,) but I should like to be at his elbow if it so happened that he was seized with an attack of

* Not the too common cant of hypocrisy—

"..... With holy leer,
Soft, smiling, and demurely looking down,
But hid the dagger underneath the gown."

"Pure religion, and undefiled before God and the Father, is this: to visit the fatherless and widows in their affliction, and keep himself unspotted from the world." (*Epistle St. James*, i. 22.)

peritonitis, such as invaded the poor shoemaker's wife; although from the sample we have of his brains, *phrenitis** might be a more probable event.

Suppose, gentlemen, the Doctor on his back, his legs drawn up, and I, an obstinate Irish fellow, *alone* and *only* at hand. We would treat him as Swift did Bishop Berkely, and not let *in* the "instrument invented in an age of barbarism." The agonised patient should faithfully promise to burn all the unsold copies of his Practice of Physic, and make a handsome and suitable public apology to the "*repudiated lancet*," before the much maligned instrument should afford him the relief to be obtained from it, and *IT ONLY*. Let us dismiss the Doctor with, *requiescat in pace*.

The foregoing case of the unfortunate shoemaker needs no comment. You remember the account of the knife-swallower, (p. 60,) where he states that he had swallowed four knives, and adds, "by this bold attempt of a *drunken* man the company was well entertained for that night!" We shall next imagine one of you, my young friends, in our position, when we long since visited a Dublin Hospital, and there learned a lesson of detestation for drunkenness, more home, practical and convincing than any philippic that we had ever heard could have produced. Fancy yourself now in the ward of an hospital—what case is that which excites so much anxious attention?—you approach the bedside of the patient—you gaze with surprise; for in his sadly altered features you recognize the countenance of him once affluent and respectable—the sharer of your father's hospitality and friendship; so often the welcomed inventor of your youthful sports: alas! how changed the scene—how altered the actor! The history of that case

* Inflammation of the brain, or its membranes, is commonly attended with *maniacal* symptoms.

is brief. A fatal epidemic bereaved him of his beloved wife and darling children—in one short week, all, held dear, removed. Melancholy marks him for her own. At length, he is persuaded by injudicious and false friends to attempt to dissipate his grief by plunging into the vortex of all the gay fashionable follies of the day—nay more, he is ultimately induced to drown his sorrows in the bowl. Oh! delusive and fatal remedy! The livery of melancholy was soon exchanged for that of revelry and drunkenness. Poverty and degradation—the usual attendants—quickly supervened; he has now become the confirmed drivelling drunkard, alike despicable and detestable.

But a few nights ago, returning from the public-house with unsteady pace, he staggered, fell, and in attempting to regain his feet, converted a simple fracture of the leg and dislocation of the foot, into a most dangerous form of injury. He is now, unfortunate and ill-fated man, labouring under *Delirium Tremens*, commonly called “Whiskey Fever.”

Observe the haggard wildness of his countenance—his hands and whole frame so tremulous—so characteristic of the disease. Mark how he attempts to rise from bed, reckless, regardless, and apparently unconscious of the existence of a fractured and dislocated limb. Now he addresses one of his late associates in drunkenness, with so much earnestness, that he almost induces us to suppose the individual in the ward; but alas! these are the ravings of delirium—he is beset by a legion of evil spirits, that haunt the ruined remains of intemperance and disease.*

* This case terminated fatally. It is hoped we shall be excused for entering so much into detail in reference to the appalling effects of intemperance; we have felt it a duty to dwell upon this subject, and to afford by the recital of the preceding cases a useful lesson to our young medical friends, in accordance with a favourite maxim:

“*Felix quem faciunt aliena pericula cautem.*”

Mr. Wakley, M.P., a surgeon, editor of the widely circulated Medical periodical, the *Lancet*, and also coroner for Middlesex, London, stated in 1839: "I have lately seen so much of the evil effects of gin drinking, that I am inclined to become a teetotaller. Gin may be thought the best friend I have; it causes me to hold annually *one thousand* inquests more than I should otherwise hold. But besides these I have reason to believe that from *ten thousand to fifteen thousand* persons in the metropolis die annually from the effects of gin drinking, upon whom no inquests are held. Since I have been coroner, I have seen so many murders by poison, by drowning, by hanging, by cutting the throat, in consequence of drinking ardent spirits, that I am astonished the Legislature does not interfere. I am confident that they will before long be obliged to interfere with respect to the sale of *liquors containing alcohol*."

We shall here state what is undoubtedly true—and we say it with pride—that the Medical profession has always been pre-eminently remarkable for its efforts to preserve public health, and avert disease by all possible means. Have not its followers been ever amongst the foremost, if not the first, to found and cherish temperance societies, which we all know strike most deeply at the very root of disease?

It is plain that the philanthropy which prompts and leads to the dissemination of those physiological principles that so materially contribute to preserve health, must, at the same time, tend, to a like extent, to diminish the pecuniary remuneration of the followers of the healing art. Comparisons are said to be odious. We shall not make any; nor shall we contrast our calling with that of others. The profession is paramount—of absorbing im-

portance—one ennobled and exalted by its very office—the God-like function of removing, or alleviating disease—preserving health and prolonging life.

Blessings that have never been suspended, are but inadequately estimated—the healing art and its votaries, are both held of little value by very many of the uniformly healthy: those that boast of the constant coexistence and enjoyment of the *mens sana in corpore sano*. Enquire not of him of sound body and of vigorous mind, but ask the blind restored to sight—the deaf restored to hearing—the diseased to health—the afflicted to comfort; and you will learn in the overflowing of their grateful hearts, the nature, the value of this divine art, coeval with the earliest afflictions, the best affections and sympathies of our nature.

LECTURE V.

CHYLIFICATION.

We come next to convey the chyme into the intestinal canal, and to consider how digestion is effected in the upper (small) intestine, or chylification. We shall be exceedingly brief upon this portion of the subject, for the best reason in the world—because little is known about it. It would be indeed a lengthy process even to enumerate the theories—shall we call them the vagaries—of authors upon this subject. We already detained you a long time when upon “the discovery of the vital principle;” but if we once commenced a “yarn” upon the spleen, we should run you to the antipodes before we ended, for it has been said to be the seat alternately of anger, mirth, and

melancholy. We often, you are aware, place our bad temper upon its back, and say with Swift,

“ You humour me when I am sick,
Why not when I am *splenetic* ?”

We would scarcely suppose that Paley, usually profound, and indeed learned, upon these subjects, could have written thus: “ It is possible that the spleen may be a mere stuffing, a soft cushion to fill up a vacancy or hollow,* which, unless occupied, would leave the package loose and unsteady ; for supposing that it answers no other purpose than this, it must be vascular, and admit of circulation, in order to be kept alive, or be part of a living body.” One would imagine, from the foregoing quotation, that the abdominal organs were esteemed crockery-ware by this author. Wisdom has been denied even to Jove himself when in love ; after this specimen theorists may “ claim kindred” to lovers, and, when on their hobby, we may justly add, “ have their claims allowed.” Well, in the first portion of the small intestine (duodenum) a sort of decomposition of the chyme takes place, by which the nutritious portion (chyle) is separated from the excrementitious part : in the remainder of this intestine (jejunum and ileum) the former is absorbed, while the latter is conveyed onward into the lower (large) intestine, which is a reservoir for the effete and residual contents.

Firstly ; we have seen that the stomach, by the agency of gastric juice, effects the grand object of blending and uniting all kinds of food into one uniform homogeneous pulpy mass ; next, we find the duodenum or first intestine—discharging the function of a second stomach, by the aid of secretions derived from its lining membrane,

* Nature has a horror of a vacuum. There is no such thing as space *unoccupied* here ; the walls and all the organs are in perfectly close apposition—as close as plaster when making a cast.

from the liver and the pancreas or sweet-bread—eliminates the milky chyle. The conveyance of this fluid to the blood, by the absorbent vessels that open by innumerable mouths upon the internal surface of the intestine, constitutes, a new function, namely, nutritive absorption. We have seen (p. 94) that Dr. Prout named milk “the great alimentary prototype.” It is curious to observe, that after the elaborate processes effected by the digestive apparatus upon the aliment, a product so resembling milk is the result, that the vessels which convey it to the circulation were named by their discoverer lacteals. (Lac signifies milk.) It is obvious, from the anatomy of the lower intestine, (divided into cæcum, colon, and rectum,) that it is intended to exercise a distinct function, as a valvular structure is found at the termination of the small intestine in the cæcum, which, in ordinary, perfectly prevents regurgitation.

We have mentioned (p. 82) the reason why herbivorous animals have a longer alimentary canal than carnivorous. We find, for example, the ram has the intestines twenty-seven times the length of its body; the ox, twenty-two times; the horse, ten times; man, five and-a-half times; the lion, three times; and the shark little more than three-fourths of its length. In speaking of the intestinal canal in fish, we mentioned that a large abdominal development would tend to retard their progress, and thus interfere with their predaceous habits. We find in the small intestine of man a number of permanent projecting folds, (valvulæ conniventes,) which, like the spiral ones of some fish, increase the surface and retard the contents. The folds of the lining membrane that are observed in the collapsed condition of the stomach, are temporary, and are a provision for the sudden increase of size, which this organ undergoes on the reception of much aliment, when they are obliterated. The popular notion of “taking

the wrinkles out of the stomach," by the reception of food, is consequently well founded; but I believe the allusion is made in this case to the skin, and not to the lining membrane. The duodenum is fixed, dilatable, and has opening into its most pendulous part, the canals which convey the bile and pancreatic fluid into this intestine; the duct from the liver proceeding so low down, necessarily indicates that it was not intended that bile should enter the stomach* in ordinary; but this fluid may, by an inverted action of the duodenum, be sent through the pylorus into the former, of which we have evidence when bilious vomiting occurs. It is not our intention to trouble you with the *rexata questio* of the analysis of any of the secretions, a subject involved in great obscurity. You must be satisfied with the substantive properties—what can be felt, seen, and, above all, *understood*. Well, we shall dismiss all about the liver—the very box of Pandora—in brief space. It is the largest gland† in the body, varying in weight from two to five pounds; is abundantly supplied with blood and with nerves; the latter connect this organ in intimate sympathy with the brain and stomach: hence the remarkable influence produced by its derangement, either functional or organic, upon the whole system. It is a matter of ordinary observation that diseased conditions of the abdominal organs, more especially of this important gland, give rise to great depression of mind. It is not generally known that the etymology of melancholy, as well as the cause of this

* The stomach receives the bile and pancreatic fluid in all invertebrated animals. (See Table III.)

† A lady in our presence inquired of a physician, remarkable alike for his taciturnity and judgment, "Where is the liver placed?" The doctor laconically replied, "Just where you have seen it in a fowl, ma'am, tucked under the right wing." One of the uses of the spleen assigned by the *Gilpin* physiologists was, that it on the left acted as a counterpoise to the liver on the opposite side!!

affection, have had their origin in the well founded belief that the secretion of black bile conjured up the blue imps ; in fact the word is but the name for this inky fluid, in Greek *μείλαινα* black, and *χολη* bile. Irritability, as well as sullenness and moroseness, have been attributed to a like cause, and excuse has been frequently offered by the considerate portion of mankind for ill humour, by saying that the irritable individual is then plagued with a flow of black bile. Expressions of a figurative kind are in every-day use, implying this state : “ He dips his pen in gall.” In the sacred Scriptures we read, “ In the gall of bitterness.” Again : “ Husbands, love your wives, and be not *bitter* against them.” Indeed, we have mixed up the deranged condition of this organ as the “ head and front” of all offending on the part of the digestive apparatus ; and hence, every disorder of the stomach and bowels has been named bilious, although the fault should be exclusively attributable to the stomach. But there is always a popular disease to which all others are most conveniently referred. This must have originated with the medical profession, as they so frequently, and indeed justly, attribute the common derangements of the system to the unhealthy secretion of the liver. To look “ bilious and interesting” is more common now-a-days than what was formerly pithily described by the terms, “ mild, pale, penetrating.” Now, bile discharges with respect to chyfication nearly as important a function as gastric juice does in reference to chymification, and this we may say despite of Tiedemann and Gmelin, &c. It is, firstly, the agent that resolves the aliment into a nutritive portion—chyle, and the residual excrementitious mass ; secondly, it is that which causes the latter to be propelled through the intestinal canal, by affording an element which gives the healthy stimulus, and thus excites the muscular coat

of the bowels to contract.* It is plain, then, that bile is an essentially useful agent in reference to digestion, eliminating the nutritious portion, and exciting the expulsion of the excrementitious part of the food; but like all other good things in the world, faults may lie either on the side of quality or quantity, or even of both, at the same time. Some, for instance, have too much, others too little bile, or it may be vitiated. These are the conditions that are truly bilious diseases; but it is the prevention, not the remedy, of these affections which is to be entertained in those lectures. We think it quite unnecessary here, to say more of the anatomical structure of the liver than that the bile is formed from the blood† conveyed to this organ; that a duct or tube, liver-duct, meets another coming from the gall-bladder, each of which is about an inch and-a-half long; they then terminate in a common duct of about three inches, consequently twice the length of either, and which finally glides in an oblique valvular manner through the coats of the intestine, (duodenum,) so as to prevent regurgitation of the bile towards the liver, when once this fluid has been deposited at its destination. Remember that you are informed of the preceding facts, in order that I may enforce certain rules hereafter, by referring to this anatomical description as data, or things proved. Beaumont states, that gastric

* In jaundice the bowels are torpid, because bile is either altogether withheld, or it descends in greatly diminished quantity into the intestinal canal.

† We may here briefly state, that the blood is that wonderful fluid which, when sent to the different parts of the body, constitutes the material from which the specific product is elaborated, by the respective organs; for example, gastric juice, by the stomach—bile, by the liver—phosphate of lime in the bone—and fibrin (flesh) in the muscle. This curious and inscrutable process is called *secretion*—the deeply-veiled offspring of life!

juice is secreted only at the period when the food enters the stomach. Now, the liver would appear in this particular more provident than the former organ; as chyification occurs but at certain periods—that is, when chyme is in the duodenum—it would be a waste to send bile into the intestine when this substance is absent; therefore, in the intervals, the bile accumulates in the gall bladder—a mere reservoir connected to the liver—and consequently can be furnished, when required in considerable quantity, at once; instead of waiting for its slow secretion by, and passage from this gland, which would of course materially retard the supply to the system of the nutritive chyle. But we should not, without just grounds, compliment the liver at the expense of the stomach. We may briefly explain that the circumstances are not alike in relation to their respective secretions, for the gastric juice is poured out at once, by myriads of minute blood-vessels which open on the intensely vascular lining membrane of the latter organ, with which the food is in immediate contact; while the bile has not only to be secreted by an elaborate apparatus, but also must be conveyed from a remote quarter to the chyme, upon which it is destined to act. The fluid from the pancreas or sweetbread is very similar to saliva. In the days of the humoral physiologists, the bile was considered acid, and the pancreatic fluid alkaline, and thus their admixture was supposed to form a sort of neutral bland compound: in more modern times the unctuous bile is said to mix with the alkaline secretion of the pancreas, and, like the ordinary compound of hartshorn (alkali) and oil, thus to form a saponaceous substance readily miscible with the chyme.

{ We have already mentioned that in despite of all that has been “said and sung,” we have still to learn what is

the function of the spleen. But we should have told you that physiologists, not content with making it the seat of the passions, and of almost everything under the sun besides, conjectured at length that it was the seat of the soul !!!

Risum teneatis amici ?

We have seen that *whatever is, is right*, and that nature never creates anything in vain ; consequently, we should not affirm, with Erasistratus, that this organ was useless, because our erring reason had been unable to discover its function. Need we say how idle and presumptuous would be such an opinion ! The small and large intestines exercise different functions ; the former is the seat of the absorption of chyle, while the latter is the reservoir for the residual mass. The lining membrane of both is continuous with that of the stomach. The supply of blood-vessels to this organ and the small intestines is much greater than that to the large or lower bowels ; but from the mouth to the termination, the vascular distribution to the great alimentary tube is very considerable, and a free communication is established throughout, so that if any cause should produce obstruction to the flow of blood by one set of vessels, others contiguous would at once take on their office. Indeed, when aware of this anatomical fact, and of the abundant supply of nerves distributed, in order to give sensibility to the same surface, we should be filled with admiration and thankfulness at the wonderful and merciful provision made by our beneficent Creator, for enabling us to swallow often, very often, with so much impunity, substances most irritating, either in a mechanical or chemical point of view. (See p. 57.)

It is right to remember that the small intestines are held but loosely by the smooth and moist serous membrane that

envelopes them, and which thus at once permits free motion of their parts on each other, and obviates the consequences of friction. These intestines have been hence named loose or floating, occupying the middle region of the abdomen, while the large intestines, less moveable, form nearly a circle around them, presenting an oval picture, of which the former constitutes the subject, and the latter the frame. We have of course a middle muscular coat to propel the contents downwards, and an internal lining or mucous membrane, a continuation of that of the stomach, and which we have already informed you is one perfectly continuous membrane from the mouth to the termination of the alimentary canal, and identified with the skin at each extremity. We have seen that this lining membrane is thrown into projecting folds (*valvulæ conniventes*) in the small intestines, which must both extend the surface for absorption of the chyle, and also retard the progress of the whole alimentary mass. This tube is a uniform cylinder—not so the large intestines, for they are sacculated, owing to three longitudinal muscular bands—which extend from the commencement to the termination of the tract—being shorter than this division of the canal, consequently the latter is puckered up and thrown into cells which constitute off-sets from the axis of the intestines. This contrivance permits the residual matter to remain a considerable time in the large intestines, so that although the latter do not contain *valvulæ conniventes*, a delay is produced by the foregoing structure. Indeed, in some instances, accumulations occur in these cells to such an extent as to lay the foundation of a very formidable disease. The muscular coat of both intestines is like that of the stomach, not under the influence of the will, being supplied exclusively by the involuntary nerves. The Creator having ordained

that those functions essential to our preservation shall not require consciousness, or the direction of the will, for their effectual performance; but still the involuntary and voluntary (vegetative and relative, 41, 42) systems are closely allied. We are all familiar with the influence which the mind exercises on many occasions over the functions of the bowels.* At the termination of the large intestine, we now find a mixture of three kinds of muscle; for obvious reasons, to the involuntary are added the voluntary, and also the mixed: one serving for our waking moments, the other, called into action during sleep. From what we have been stating, it is plain that the contents from the commencement to the termination of the alimentary canal, are propelled by the agency of muscular fibre; and whenever we mention this agent, commonly called flesh, you are always to conclude that we mean an active inherent moving power, not simple elasticity. Several circumstances must combine to ensure the perfect action of the intestinal canal. 1stly. The healthy condition of the muscular fibre, and also of those nerves which are destined to convey the impression made upon them by the contents of the intestine. 2ndly. A proper quantity and quality of bile, which fluid appears to be the natural excitant of the nerves, which influence the muscular fibre. 3rdly. A healthy supply of intestinal secretion. 4thly. The agency of the abdominal muscles and the diaphragm.

We have in the preceding pages given but a brief and cursory description of the organs engaged in the important function of digestion; but as we stated at the outset our opinion that anatomical details were unsuitable for the public, we have consequently withheld them. We purpose,

* These organs in the high-bred horse are much affected by the coming race.

in the next place, in following out the plan laid down (p. 43), to make a practical recapitulation, which will also include the modifications which the function of digestion will necessarily present according to age, sex, temperament, climate, seasons, habit, and at the same time referring to these principles and data already laid down, and with which, I trust, you are now so conversant, that they will be readily received as premises, from which we may draw legitimate conclusions. It is stated (p. 42) that the nutritive functions comprise the following: 1. Digestion eliminates the nutritive part. 2. Absorption conveys the latter into the blood. 3. Circulation carries the blood to all parts of the body. 4. Respiration; and 5. Secretion, purify this fluid. The blood so replenished, purified, and animalized, becomes now suitable for the end in view, namely, 6, Nutrition. We have referred to the preceding, because, in the observations that we are about to make, allusion will be often made to the five other functions concerned in the end of all—nutrition, and which are to be entertained hereafter; but we esteem this place the most suitable for the consideration of those practical particulars to which it has been our especial purpose to direct your attention.

The stomach, being well named the “centre of sympathy,” will be influenced so materially by the other functions, both corporeal and mental, that you must excuse me for appearing to digress, by dwelling on matters that might be supposed irrelevant to the function of digestion. Remember that man has been destined “to eat his bread in the sweat of his brow,” and we all know that many—more especially those I address—have been also doomed to earn that bread by “the sweat of their brain;” but, gentlemen, the sweetest bread that was ever eaten, is that which has been obtained as the fruit of your own labours—

whether mental or corporeal. The cheering conviction thus produced spreads a pleasurable sensation through the whole inner man, in which the nerves supplying the stomach abundantly participate. Providence has closely linked industry and happiness, and ordained them to be Siamese sisters. "The gods," says the poet, "have placed labour and toil in the way leading to the Elysian fields." Whether we labour with our hands, or with our heads, or with both together; or now one, and again the other, we would have you undertake your work, more especially the mental portion of it, with energy, aye, with enthusiasm—the soul-awakening spirit that fires the youth—implants the "will invincible"—bids the march of mind never halt, and cheers on industry and genius in their glorious struggle up the rough and rugged steep that leads to knowledge and to virtue's temple. But you must ever bear in mind the principle so well established in the animal œconomy, that power and action should be always commensurate. You, no doubt, have heard the common exclamation, that "Mr. A.'s soul is too big for his body;" or in other words, the latter is overtaxed by the former. We must not be deluded by the fascinating pleasures connected with mental enjoyment, nor banish "nature's soft nurse, balmy sleep;" although we can truly say that these seductive occupations are professional, or literary pleasures—pleasures which will never pall—that bring with them the delightful conviction, that we are laying up a store for hereafter, upon which fond memory may dwell and ruminate in pleasing and unalloyed contemplation. We have referred (p. 88) to the fatal consequences which followed excessive mental occupation. The sad and memorable case of the wizzard genius of the north, Sir W. Scott, is but too fresh in the recollection of a world still mourning

for his untimely fate. You must therefore steer between Seylla and Charybdis—idleness and labour. The preservation of health, and, we may add, of sound digestion, will be best effected by order, regularity, and temperance. Every thing should have its own time and its own place, and be performed and found accordingly : this is a most admirable practical rule, by the observance of which you will be taught the habit of punctuality as a duty : and you will be preserved from that besetting sin, procrastination, so truly named the “Thief of Time;” and which causes so many to cheat themselves of natural repose, in order to make amends for misspent time ; not unfrequently at the sacrifice of personal comfort, nay, often at the risk of health itself. From the mutual action and reaction of body and mind, whatever weakens or debilitates the former, produces a similar effect upon the latter, so that the *mens sana* must be lodged, *in corpore sano*, as its appropriate abode. A French minister, remarkable alike for the despatch of business and for his constant attendance upon places of public amusement, was asked how he contrived to effect both objects ? He replied, “Simply, by never postponing until to-morrow what can be done to-day.”

Lord Cook gives the subjoined distich :

“Six hours to sleep—to law’s grave study six ;
Four spent in prayer—the rest to nature fix.”

Sir W. Jones, a wiser economist of the fleeting hours of life, amended the sentiment in the following lines :

“Seven hours to law—to soothing slumber seven ;
Part to the world allot, and all to Heaven.”

Hear our plan : three is a “lucky number ;” well, let us divide the day—twenty-four hours—into three equal parts : say eight hours for sleep, eight hours for business, and

the remaining eight for prayer, meals, exercise, recreation, &c.: this gives you forty-eight hours work per week, 2,496 per year. Now, if you acquired a fact during every quarter of an hour's study, at the termination of a year it would amount to nearly 10,000. Supposing you were but four years as a pupil at the profession, at the expiration of this period, if your memory were faithful, you would be in possession of nearly 40,000 facts—useful professional facts. What a load of information to throw down on the green cloth of any board of examiners! What a stock in trade to put before a discerning public!

Well, let us take a day—rise at six o'clock—study until eight—breakfast and dressing say an hour—ready for business at nine. Before four o'clock your day's work is done. You need not *study* after dinner, which we have shown is so good for digestion. You have your evenings for recreation, light reading, &c.; go to bed at ten o'clock, and so you have eight hours sleep. I am greatly mistaken if you do not call this "*otium eum dignitate*." Remember you must, as the rule, go on with regularity, and you should steal from recreation, and sometimes from repose, any deficiency that may have occurred from accidental interruption of your studies.*

We shall in the next place proceed to apply practically, and somewhat in detail, the principles already proved in reference to the function of digestion. We will in the first instance take an adult male in ordinary health, and lay down our plan for his every day habits, with reference to meals, exercise, and sleep; as also some general considerations in respect to his moral and intellectual being, so

* We are disposed to think that this plan, or some slight modification of it, would be suitable for the public in general, for we *all* should have some definite employment or *business*.

far as all these are related to the nutritive functions. We shall secondly consider the modifications which are required according to age, sex, temperament, climate, seasons, habit; as also the cautions necessary for the adoption of the valetudinarian. It may be said that such rules are not necessary for those in health; but we think otherwise; for the individual in rude health will find in the long run—nor indeed will the run be so long,—that if he be recklessly inattentive to those important considerations, indigestion, and all its host of ills, will be the inevitable result.* What we purpose is to lay down a standard in reference to the foregoing important considerations, to which, if each individual cannot strictly conform, let him approximate it as much as possible.

We shall begin with the maxim, “*Diluculo surgere saluberimum est*: to rise betime in the morning is the most wholesome thing in the world.” We have just turned to our copy of Lilly’s grammar, for the foregoing advice, and find that it was published in 1741, precisely one hundred years ago, by S. Buckley and T. Longman, London. We presume it was an “old say” at that time. It is in as full force at the present day, and, like the immutability of truth,† is not affected by the lapse of years. Well, our plan is that you rise at six o’clock. I find on the page preceeding “*An introduction to the eight parts of Latin speech*” in this work, the following, both in Latin and in English; and as I think it so applicable to you, my young friends, as an initiatory proceeding after you have “shaken off dull sloth, and early rise,” I will give you the portion of it in English.

* Even *stone* itself is worn by a single drop constantly falling upon it.

† “The same to-day, yesterday, and for ever.”

A PRAYER.



ALMIGHTY Lord and Merciful Father,
 Maker of Heaven and Earth, which of thy
 free Liberality givest Wisdom abundantly to
 all that with Faith and full Assurance ask it of thee,
 beautify by the Light of thy Heavenly grace the
 Towardness of my Wit, the which with all Powers of
 Nature thou hast poured into me ; that I may not only
 understand those things which may effectually bring me to
 the Knowledge of thee and the Lord Jesu our Saviour ;
 but also with my whole Heart and Will constantly follow
 the same and receive daily Increase through thy Goodness
 towards me as well in good Life as Doctrine ; so that thou
 which workest all things in all Creatures mayest make thy
 gracious Benefits shine in me to the endless Glory and
 Honour of thine immortal Majesty. So be it.

I need scarcely ask your pardon for introducing from *my* old grammar the preceding excellent and simple prayer, which may well precede *your* day's work, as it does the work of Lilly. Early associations have a witchery—a fascination about them which bind us with soft and silken cords of affection to the object that elicits them. I do look upon *my* old Lilly with a sort of filial attachment. It brings back so freshly the school-boy days, the “seats of my youth, wheneverysport could please”—when every adventure, every project and prospect lent a charm which young and ardent minds ever disposed to be pleased with surrounding objects, never fail to discover. Well, there are pleasurable pains associated with the recollection of by-gone days—

“For who to dumb Forgetfulness a prey,”
 can say that the buried joys of boyhood are lost in the

retrospect? It is quite otherwise in general, and it cannot be said that we

“Left the warm precincts of a cheerful day,
Nor cast one longing, lingering look behind.”

Let us now, after this digression, consider what is to be laid down as a rule in reference to the time for breakfast. You should have this meal as soon as possible after your morning prayer, ablutions, and dressing for the day. The rule is equally applicable to the robust and the weakly; for the former has his appetite generally keen enough soon after rising, while the empty state of the stomach and upper bowels, then existing, unfits the valetudinarian for any active exercise of either mind or body. We are presuming upon the fact that from eight to ten hours have gone by since the reception of food. This rule is, we think, imperative, with reference both to the medical practitioner and medical student, for their morning avocations lead them to the bedside of the sick, and not unfrequently to anatomical investigations. It is a well ascertained fact—indeed generally known—that the fasting individual is much more obnoxious to contagion and all other causes of disease than he who has breakfasted. We shall have occasion to show, when on the function of absorption, that the state of inanition renders this much more active; and also that the same condition lowers all the vital powers, rendering them less effective in resisting the agency of external objects, such as cold and damp air, &c.

We shall next see what we are to have for breakfast. We quoted largely from Paris's eloquent description of tobacco, which is so highly prized as a popular favourite by old and young, rich and poor; but, after all, it must yield the palm to tea—delightful, fascinating, and refreshing tea—the beverage that forms an element of the breakfast of the inhabitant both of the castle and the cottage.* Or,

as the witty Dean Swift observed, "that such is the extent of modern epicurism, that *the world must be encompassed before a washerwoman can sit down to breakfast.*" We must admit that although tea and coffee are, as they are called, "nervous beverages;" yet still, while they exhilarate, they do not intoxicate, or "steal away the brains." A modern fine lady, in our times, never pleads guilty to more than the "wing of a lark" as a supplement to her toast and tea; while "a maid of honour in the court of Elizabeth breakfasted upon beef, and drank ale after it." This can be readily accounted for by considering how much health, appetite, and digestion, are influenced by early rising, active habits, and out-of-door exercise, all of which were practised by the latter; while the former appears to avoid "all those causes that put the action of the organs in play, and accelerate the nutritive process with which hunger is essentially connected." (P. 48.) We must certainly make a most important and meritorious exception in favour of equestrian exercise, which we are glad to find is now so generally the fashion. If we could add "early to bed and early to rise" to this wholesome and inspiring exercise, how much more blooming would our fair countrywomen look; and although they might not be able for beef and mutton in the morning, we would venture to say it would be very acceptable at dinner hour.

Dr. Kitchener tells us (Cook's Oracle, p. 416) that, according to the Chinese fashion, we let the hot water remain too long soaking upon the tea, "which makes it extract into itself the earthy parts of the herb; the water must remain upon it no longer than while you can say the '*Misserere*' psalm very leisurely. You have then only the spiritual part of the tea, the proportion of which to the water should be about a drachm (60 grains) to a pint." The Doctor also mentions

that they frequently take the yolks of two new-laid eggs, and beat them up with as much fine sugar as is sufficient for the tea, and stir all well together. "This," he adds, "is 'Chinese soup,' a nutritious and substantial meal for a traveller." Now we would see no objection to this light infusion of tea; (drachm to the pint;) in the mode of preparation pointed out, the aromatic property will be perceived, without the bitter and astringent taste which results when tea is left to stand for a long time.

Philip observes, tea and coffee possess a narcotic* power. "By many they are regarded as a fruitful cause of indigestion; but their effects on the whole have, perhaps, been overrated. Green tea, and a very strong infusion of black tea or coffee, are injurious to many stomachs. I have repeatedly seen severe fits of indigestion induced by them, always characterised by a greater than usual degree of nervous affection. To many, however, even these, and to most people, a moderately strong infusion of black tea and coffee seem to be innocent. They produce no present bad effects, and where this is the case, I have never been able to perceive any proof of their continued use doing harm. It is remarkable that their peculiarly refreshing, sedative effect is generally, in the first instance, felt even by those with whom they most disagree. If drunk very hot, they, of course, produce the effects of other hot fluids.

It is by no means a fair inference, that what produces very injurious consequences in some, must do more or less harm in all.† We frequently see articles of diet, and still

* Narcotics cause the sensation of hunger to cease. (P. 45.) Tea, coffee, alcohol, wine, &c., are all at first stimulants, and subsequently sedatives.

† This would be arguing from the particular to the universal, which, of course, is a fallacious mode of reasoning.

more frequently medicines, which cannot be borne by one stomach, perfectly innocent to another.*

The tendency of tea and coffee to prevent sleep in many people—for even this effect is by no means universal—must be injurious as far as the want of sleep is so. It is generally in those in whom they produce most of this effect, that the other injurious effects are most apt to appear."

Paris says, in reference to tea: "There is no subject that has occasioned a greater controversy amongst dietetic writers than the subject of tea. By one party it is decried as a poison; by another, it is extolled as a medicine and a valuable addition to our food; while some refer all its beneficial effects to the water thus introduced into the system, and its evil consequences to the high temperature at which it is drunk." We have heard it observed by some, that it must be a very slow poison: for though they have been drinking it all their lives, yet they are in the land of the living still. It is well known that tea is mixed often with sloe leaves; hence, if we may be permitted to pun, this beverage so adulterated may be named *sloe* poison. You will find that those gentry who are addicted to "alcoholic potations," speak of tea with most sovereign contempt. "Hog-wash, a cup of the seald," &c., are the opprobrious epithets bestowed upon this dear delightful beverage. Now we would tell these gentlemen, in the language of Father O'Leary, as applied to purgatory, "that they may travel farther and fare worse;" for if they will not stop and take tea with the ladies, the latter will be sure to conclude that their palates are accustomed to stronger drinks, and a more potent aroma than that which issues from the steaming teapot.

* "What is one man's meat is another man's poison."

We must admit, that our favourite beverage is open to the epithet "scald," for it is generally drunk at too high a temperature, owing to the grateful sensation thus caused, particularly if the stomach is debilitated; but this is injurious, because the preternatural excitement produced by the overheated liquid, stimulates too much the stomach, and finally induces it to fall as much below par as it had been previously raised above it. This law we referred to before, as alike applicable both to the physical and moral portion of our being (p. 101.) Beaumont has shown, (p. 77,) that the natural temperature of the stomach is about 100° Fahrenheit; 98° being blood heat, or that of the body; and also "that exercise elevates the temperature, and sleep or rest in a recumbent position depresses it." Those who breakfast in bed, or soon after rising, should therefore recollect, that the fluids then taken ought to be at a lower temperature than under opposite circumstances. Philip observes, "when fluids of the usual temperature of the air are too cold for a weak stomach, which is frequently the case, there is no objection to raising them to any degree that does not exceed that of the body; although, when the stomach bears it well, fluids of the common temperature seem rather to have a tonic effect in indigestion. A very low temperature is objectionable. I have had already occasion to observe, that fits of indigestion may be induced in weak stomachs by iced fluids."

We may add that, with reference to bathing, a nearly analogous rule should be adopted. When there is sufficient vigour to produce healthy reaction, we recommend the cold bath, but if this be not the case we direct the tepid one.*

Green tea has a much more powerful influence over the

* The analogy between the lining membrane and the skin, in reference to anatomy, function, and disease, was referred to before (p. 44).

nervous system than black tea. A late writer (Newenham) upon "the medicinal and dietetic properties of the former," refers the different effects produced by green tea to the different states of the system in which it is taken. He maintains that, "in a state of what we call *sthenic* (strong) *excitement* of the brain and nervous system as that produced by alcoholic stimulants, or by intense and long-continued application of the mind to any particular object of literary research, green tea will act as a salutary remedy; whereas, on the contrary, in states of diminished excitement, morbid vigilance and nervous disturbance will follow its potation."

Indeed this theory is borne out in practice, for we find that those gentlemen who are not "seasoned casks," and take too much wine or punch, are greatly relieved of headache, &c., soon after, by a strong cup of green tea; but Lord Byron appears to have given the preference the morning after "to repentance and soda-water." Again, we find that green tea is in great requisition at *large* parties, for here the lads and the lasses are both in a high state of agreeable and amiable excitement. Fine figures—fine faces—sparkling eyes—*on dit* and *bon mot*, are felt, seen, heard, and understood in all possible varieties, after a most substantive, sentimental, and interesting fashion. The exhilarating green tea, as well as the aromatic coffee, are both in perfect keeping with the whole scene; they are tributary, like the music, the mellow and the "silvery" voice, and the flashes of wit, to the enjoyment not only of the buoyant and light-hearted, but of those too that come, and successfully try to shake off sombre seriousness for a season, and exhibit the grace and beauty of their figures, as they move on the "light fantastic toe" through the mazes of the sportive dance.

The secret—the very essence of enjoyment is, that we

harmonize—co-operate with the occasion ; or, in the midst of mirth, the sullen spirit of melancholy will hover round us. The song, the music, and the dance—nay, even the “ruby wine,” but too often deepen the melancholy which the individual in low spirits can neither shake off or subdue.

{ In short, the excitement produced by green tea, aromatic coffee, nectarous wine, soul-soothing music, and all the endless mirth that the most splendid rout can afford, will fail to cheer or shed a ray of enjoyment, when care lies canker-ing at the heart’s core ; for who then, or what then, “can minister to a mind diseased,” or to him who fancies that he can fly from melancholy, and find in the midnight revel a sanctuary from sorrow, which but too painfully proves the very mockery of his woe.

Coffee, as well as tea, has had its opponents and defenders equally zealous upon their respective sides. It may be called the intellectual beverage. When strong, and when much of it is taken, it stimulates so highly the brain and nervous system, as to produce a species of inebriation. A patient of ours is relieved instantly, by a strong cup of coffee, of nervous headache, but this relief is almost invariably followed by temporary blindness. We have already (p. 97) alluded to the effect produced—diminishing very much the appetite for dinner—when taken for luncheon. This property, perhaps, may be accounted for, as well as a highly stimulating quality, owing to its containing so much nitrogen, the distinctive ultimate element of animal substances. In another, it almost instantly produces increased and vigorous action of the heart, and if persevered in, most distressing palpitations.

{ A single cup of this beverage will often cause a sleepless night, in the case of one who can take tea with impunity in this respect. Paris states, “If taken immediately after a

meal, it is not found to create that disturbance in its digestion which has been noticed as the occasional consequence of tea; on the contrary, it accelerates the operations of the stomach, and will frequently enable the dyspeptic to digest substances, such as fat and oily aliment, which would often occasion much disturbance. The custom of taking coffee immediately after dinner, so universally practised by the French, no doubt must counteract the evil effects which the peculiar forms of their diet is calculated to produce."

The late Dr. Cheyne, of this city—a warm and zealous supporter of the cause of temperance—strongly recommended a clear cup of coffee immediately after dinner, as a wholesome substitute for wine or punch. Those who are rendered vigilant at night owing to coffee after dinner, may take it at breakfast or at luncheon, without interfering with their night's rest, as its stimulating influence will have subsided before the hour for repose, when a sedative effect follows, as we have already explained as a consequence of the previous excitation.*

Paris also says, "When our object is to administer coffee as a promoter of digestion, it should be carefully made by infusion; decoction dissipates its aroma. The addition of milk is one of questionable propriety; that of sugar, or rather sugar-candy, may be allowed."

The unerring author of the *Cook's Oracle*, Dr. Kitchener, is quite of our opinion that "coffee, as used on the Continent, serves the double purpose of an agreeable tonic and an exhilarating beverage, without the unpleasant effects of wine." He adds, "Coffee, as drank in England, debilitates the stomach, and produces a slight nausea. In

* After a storm comes a calm.

† We have observed its efficacy in cases of intermittent fever or ague, where Peruvian bark disagreed.

France and Italy it is made strong from the best coffee, and is poured out hot and transparent ; in England it is usually made from bad coffee, served out tepid and muddy, and drowned in a deluge of water, and sometimes deserves the title given it in ' the Petition against Coffee,' 1674, a base, black, thick, nasty, bitter, stinking puddle water."

" To make coffee fit for use, you must employ the German filter,—pay at least four shillings the pound for it,—and take at least an ounce* for two breakfast cups."

In the next paragraphs from Kitchener we may substitute Dublin for London.

" No coffee will bear drinking with what is called milk in London."

" London people should either take their coffee pure, or put a couple of tea-spoonsful of cream to each cup."

" N.B.—The above is a contribution from an intelligent traveller, who has passed some years on the Continent." (p. 417.)

Paris states, that the article known by the name of " Hunt's Economical Breakfast Powder," is nothing more than roasted rye, which comes nearest to the true coffee.

In Ireland coarse oatmeal roasted makes a substitute for coffee of a very wholesome character, and one which frequently allays irritability of the stomach when other remedies have failed.

Paris describes the other ordinary substitutes for tea and coffee so well and briefly, that we shall beg to quote his observations here :

* We were in the habit long since of breakfasting with an old gentleman of French descent, who made delicious coffee ; he gave it, as the cooks call it, " a light boil," and said he " put an angel in the pot, and that he was always certain an angel would come out of it." A little bit of dried sole skin added to the coffee before making, clears it without a filter.

“*Chocolate*. In consequence of the large quantity of nutritive matter which this liquid contains, it should be regarded rather as food than drink. It is prepared by reducing the cocoa-nut into paste, with sugar, milk, or eggs. It is also frequently mixed with different aromatics, the most common of which is the *vanilla*, a substance very liable to disagree with the stomach, and to produce a train of nervous symptoms. As a common beverage, chocolate is highly objectionable; it contains an oil which is difficult of assimilation; it therefore oppresses the stomach: this effect is of course increased by the application of too much heat in its preparation.”

If chocolate has been condemned for being too rich, cocoa has been often rejected for its being too poor, being designated by the epithet “miserable.” “As it possesses less nutritive matter than the former, it is not so objectionable; and as the oily matter exists only in small quantities, it is less likely to disagree with the stomach.” The shell cocoa requires to be boiled for a long time—two hours. If the soluble kind be employed, this trouble may be avoided.—aromatic substances are sometimes added in order to improve its flavour.

We have hitherto spoken of those fluids which are in ordinary use at breakfast: there are others that we do not take as often as they merit. These are milk, whey, barley-water, and gruel. New milk is called “heavy,” because it contains so much cream and curd when good and pure, what we rarely find in great cities. Milk is coagulated before it is digested, as we may observe, out of the stomach, by the agency of gastric juice and rennet, and we also find that the breast-milk rejected by infants returns from their stomachs thus changed.

Those who leave off tea or coffee, and take milk, cocoa,

or chocolate, generally complain that they are sleepy all day after : this may be explained owing to the anti-narcotic (stimulating) beverages having been withdrawn, and besides, the substitutes require greater powers of digestion than were exercised during the use of tea or coffee ; consequently, when such is the case, there is a natural tendency to repose, as seen amongst the brute tribe, in the familiar domestic example of the dog. (p. 89.)

The robust and healthy are quite equal to the digestion of all the constituents of the “ great alimentary prototype ;” but those who find it too rich may either dilute it with water, or may take the milk after the cream has been skimmed. We may just remind you of what has been mentioned, (p. 94.) that milk consists of albuminous, saccharine, and oleaginous principles ; or in other words, of curd, sugar, and cream. By “ setting,” the last spontaneously rises to the surface ; by coagulation—as in making whey, by means of heat and buttermilk, or acids—the first is separated as the curd, and thus leaves the second in the remaining fluid—the whey. Hence, milk may be made more or less digestible, by withdrawing one or both the principles above mentioned. It furnishes us with an example of an exceedingly nutritive substance taken as a whole, but not then so easy of digestion as when it is deprived of its most nutritive parts, cream and curd. You will thus perceive that the fact of a substance being very nutritive is by no means synonymous with digestibility, and hence we require to make always these two inquiries before we pronounce upon the eligibility of any article of diet : firstly, is it nutritive ? secondly, is it easy of digestion ? All the constituents of milk are both for the robust—for those less healthy the oleaginous principle has to be removed ; and for the valetudinarian both the oleaginous and the albumi-

nous may require to be dismissed. For these three, respectively, the proposition will run thus: 1, new milk; 2, skimmed milk; 3, whey.

We may here remark, that it would at first sight appear rather strange that we should hold on by a species of infatuated attachment to those fascinating, but nervous beverages, tea and coffee, when we can make such wholesome substitutes for them. In truth it must be admitted, that { the mass of society are almost instinctively induced to prefer the agreeable rather than the useful; hence we generally find that not only tea and coffee, but also wine and alcoholic drinks are such general favourites; for they soothe—they tranquillize—they exhilarate—they raise the drooping spirits—in short, they put us in good humour with ourselves, with all around us, and the whole world besides.* The same is observable in the moral world—how naturally we court and relish the society of those who render themselves agreeable and pleasant companions—whose air, manner, and conversation possesses an enchanting witchery, the anomalous influence of which we vainly attempt to designate by saying we are unable to describe it—*je ne sais quoi*.

We too frequently find, like the after effects of the beverages above described, that a further acquaintance with these dear delightful creatures is not always followed by the most agreeable results; but, when it is otherwise, no wonder that Horace should give the palm to such as combine the useful and the pleasant. We do know many that possess the very milk of human kindness, with rather a

* A most intelligent lady of our acquaintance, in alluding to the influence that the condition of the body exercised over the mind, mentioned, that it was most humiliating to observe, in her own case, the effect which a single glass of wine produced upon both.

rough and uneouth exterior. True it is, that the most solid bodies are susceptible of the finest polish. 'Tis therefore to be deplored that a consciousness of integrity often produces a bluntness of manner almost amounting to rudeness, as if the purity of the individual's mind required no "outward show elaborate;" but we must, independently of possessing the best intentions, cultivate the *suaviter in modo*, while we at the same time should never lose sight of the *fortiter in re*. If this be not done, I need seareely add, whatever may be your intrinsic merit, you will not be a general favourite. It is exceedingly difficult to say *ne plus ultra*—thus far and no farther—to tea, coffee, wine, &c., as also to those agreeable companions that we have by analogy alluded to. Abstinence is an easier virtue than temperance. In other words, it is less difficult to give up totally those fascinating things, than to undertake the tantalizing task of enjoying greatly less than what we would desire. The latter is indeed a severe and strict probationary course.

Now, I will make no apology for the digressions or episodes that we shall start off with from time to time. We do think that those popular lectures of ours would not be tolerated by those they are intended for, if they were not occasionally lightened or enlivened by a departure from the useful things ealled matter of fact, the exclusive detail of which would, we apprehend, prove to be but wearisome arteiles for the general reader.

The next beverage we shall consider is barley-water, or decoction of this substance. It is so much associated with the sick room, that it is too rarely used when we are well. Paris states that it is a long time in use—a good test of its value; "it is recommended by Hippocrates, and preferred by him to every other aliment in acute diseases. Barley

has the advantage over other grains, in affording less viscid potations. The invention of *pearl barley* has greatly increased the value of this grain; it is prepared by the removal of the husk or cuticle, and afterwards by being rounded and polished in a mill. These well known grains consist chiefly of fecula, with portions of mucilage, gluten, and sugar, which water extracts by decoction; but the solution soon passes into the acetous fermentation. The bran of barley contains an acrid resin, and it is to get rid of such an ingredient that it is deprived of its cuticle. The addition of lemon juice and sugar-candy greatly improves the flavour of this drink."

Dr. Kitchiner gives the following receipt for barley-water :

"Take a couple of ounces of pearl-barley, wash it clean with cold water, put it into half a pint of boiling water, and let it boil for five minutes : pour off this water, and add to it two quarts of boiling water : boil it to two pints, and strain it. The above is simple barley-water : to a quart of this is frequently added two ounces of figs sliced, the same of raisins stoned, half an ounce of liquorice, sliced and bruised, and a pint of water : boil it until reduced to a quart, and strain.* *Observations.* These drinks are intended to assuage thirst in ardent fevers, and inflammatory disorders, for which plenty of mild diluting liquor is one of the principle remedies ; and if not suggested by the medical

* This is identical with the "*compound decoction of barley*," as directed in the London Pharmacopœia. It is gently aperient. Dr. Thomson (*London Dispensatory*) says of the simple barley-water, that, "mixed with an equal quantity of good milk and a small portion of sugar, it is an excellent substitute for the breast milk, in those cases in which infants are so unfortunate as to require being brought up with the spoon." Our experience in such cases induces us to give a decided preference to ass's milk, unmixd with barley-water.

attendant, is frequently demanded by honest instinct in terms too plain to be misunderstood. The stomach sympathises with every fibre of the human frame, and no part of it can be distressed without in some degree offending the stomach :* therefore it is of the utmost importance to soothe this grand organ, by rendering everything we offer to it as elegant and agreeable as the nature of the case will admit of: the barley drink prepared according to the second receipt will be received with pleasure by the most delicate palate."

Gruel, made either with groats or oatmeal, is also an excellent aliment; when there is a torpid condition of the bowels this will be a most useful remedy, or what in its solid form constitutes so much of the diet of the hardy and healthy Scotch peasantry, well known in Ireland by the name of stirabout, or hasty pudding. Oatmeal diet—more especially with butter—is observed to produce a considerable tendency to acidity; but the heart-burn, which occasionally results from its use, will, by substituting milk for butter, or by persevering for eight or ten days, be quite removed. This is material to be borne in mind, as the occurrence of that symptom commonly induces the individual to decline the wholesome diet without giving it a fair trial.

Dr. Kitchiner, named our "culinary censor" by Dr. Paris, directs gruel to be made as follows: "Ask those who are to eat it, if they like it thick or thin; if the latter, mix well together by degrees, in a pint basin, one table-spoonful of oatmeal, with three of cold water: if the former, use two spoonfuls.

Have ready in a stew-pan, a pint of boiling water or

* This organ was named by Hunter "the centre of sympathy."

milk—pour this by degrees to the oatmeal you have mixed—return it into the stew-pan—set it on the fire—let it boil for five minutes, stirring it all the time, to prevent the oatmeal from burning at the bottom of the stew-pan—skim and strain it through a hair-sieve.

To convert this into *caudle*, add a little ale, wine, or brandy, with sugar, and if the bowels are disordered, a little nutmeg or ginger grated."

So far as nutmeg or ginger, we say yea, but we cannot give our assent to the alcoholic additions.

Kitchiner adds "plain gruel, such as is directed in the first part of this receipt, is one of the best breakfasts and suppers that we can recommend to the rational epicure—is the most comfortable soother of an irritable stomach that we know, and particularly acceptable to it after a hard day's work of intemperate feasting—when the addition of half an ounce of butter and a tea-spoonful of Epsom salt,* will give it an aperient quality, which will assist the principle viscera to get rid of their burden."

Well, for our own part, we would be sorry to combine either salts or butter with *our* gruel, for they would, owing to such a nauseating association, tend ever after to give us a distaste for the plain gruel. If the gourmand requires an aperient, let him take his Epsom salt or castor oil first, and, after an hour or two, aid their action by the simple gruel seasoned with sugar, nutmeg, or ginger.

* Dr. Thomson states that phosphate of soda (a mild aperient) "may be given dissolved in gruel or broth, made without salt, by which its taste is very effectually covered; and hence this is a cathartic excellently adapted for children and others who have a fastidious taste." Our experience and sense of taste do not coincide with this view. "Disguise thyself as thou wilt, still *physic*! say I—still—thou art a bitter draught! and though thousands in all ages have been made to drink of thee, thou art no less bitter on that account."

Kitchiner quotes as follows :

“ Water-gruel, says Tryon, in his *Observations on Health*, 1688, is the king of spoon-meats, and the queen of soups, and gratifies nature beyond all others.”

“ In the ‘ *Art of Thriving*,’ 1697, are directions for preparing four score noble and wholesome dishes, upon most of which *a man may live excellent well for two pence a-day*. The author’s observation on water-gruel is, that ‘ *Essence of oatmeal makes a noble and exhilarating meal.*’ ”*

Dr. Franklin’s favourite breakfast was a good basin of warm gruel, in which there was a small slice of butter, with toasted bread and nutmeg : the expense of this he reckoned at three halfpence.

Scotch Burgoo. “ This humble dish of our northern brethren forms no contemptible article of food. It possesses the grand qualities of salubrity, pleasantness, and cheapness. It is in fact a sort of oatmeal hasty pudding, without milk, much used by those patterns of combined industry, frugality, and temperance, the Scottish peasantry; and this, among other examples of the economical Scotch, is well worthy of being occasionally adopted by all who { have large families and small incomes. It is made in the following easy and expeditious manner :

To a quart of oatmeal add gradually two quarts of

* While writing this, I have been informed by a friend, a talented physician and accurate observer, that one of his children, for whom I have occasionally prescribed, was altogether relieved from the necessity of taking blue pill—the only medicine that caused healthy alvine discharges—by giving the little patient thin stirabout boiled for a long time, and to a glutinous consistence. Indeed, this wholesome aliment is popularly and justly designated, “ food and physic.” The diuretic properties of gruel are generally well marked, more especially when it does not prove aperient.

water, so that the whole may smoothly mix ; then, stirring it continually over the fire, boil it together for a quarter of an hour ; after which, take it up, and put in a little salt and butter, with or without pepper. This quantity will serve a family of five or six persons for a moderate meal."* The salt will be more uniformly diffused by dissolving it in the water before mixing the meal. The addition of pepper is not usually made in Ireland.† Butter is often eaten with it when cooked ; but we have just observed that when taken with stirabout instead of milk, it is apt to produce a tendency to heart-burn. Those in health, and who take this food with a view to its aperient effect, may do so after it is boiled for a short time ; and if they will consent to substitute treacle or honey for milk, this intention will be then more decidedly fulfilled. The hasty pudding often causes a drowsy condition through the day—more especially when neither tea nor coffee has been taken at breakfast. In such cases it may be eaten for supper, or instead of tea in the afternoon, when its effects in this way will now prove anodyne at a most seasonable time.

Paris states that by impregnating water with the soluble parts of toasted bread (toast water) it will frequently agree with those stomachs which rebel against the use of the pure fluid. It is thus rendered slightly nutritive, holding a certain portion of gum and starch in solution. Sir A. Carlisle recommends that it should be prepared with hard biscuit reduced by fire to a coffee colour. This

* Our experience induces us to recommend for persons of delicate habit and fastidious taste, prolonged boiling—at least half-an-hour. { In some instances flummery will prove useful when stirabout disagrees. The latter should be discontinued occasionally. We have known it, when used for a long time, to be detained in the large intestine, accumulating in the cells of the colon. (P. 124.)

† Paddy is hot enough, God knows, without pepper.

drink, being free from yeast, is a most agreeable beverage. Much depends upon the water being at a boiling temperature, and it ought to be drank as soon as it has cooled sufficiently; for by keeping, it acquires an unpleasant flavour. With reference to *sage*, *balm*, and *rosemary*, which were formerly so be-praised, Paris conceives that in the form of infusion, they possess some power in allaying irritability of the stomach; and that, on many occasions, they will furnish a salutary beverage. The Chinese frequently use the infusion of sage as a tonic for debility of the stomach.* Paris also states that a drink extremely agreeable to the stomach of invalids may be made by infusing lemon peel in boiling water, and adding a small quantity of sugar. The late Dr. Cheyne, of Dublin, strongly recommended this drink, made as above, with the addition of a few cloves. Dr. Kitchiner mentions that tea made with dried and bruised Seville orange-peel, in the same way as common tea, and drank with milk and sugar, has been taken by nervous and dyspeptic persons with great benefit.

When we come to speak of the valetudinarian, we shall have to offer him a strong recommendation of ass's milk, which we have known to contribute essentially in prolonging the life of the old—acting as a soothing anodyne and nutritive beverage, when the stomach could bear little else; and again, proving most useful in general debility, and in the cases of young children that had been prematurely and injudiciously weaned. The wholesome fashion of drinking goats' whey at our adjoining

* Those who have weakened this organ by taking too much, or too strong tea, should profit by the experience of the inhabitants of the land of "this oriental herb."

village, Dundrum, has gone too much out of vogue, together with the equally healthy custom of early rising and active exercise.

As we have detained you beyond the usual limit, we shall postpone the further consideration of this subject (breakfast) until our next meeting.

LECTURE VI.

Having occupied your attention during the last lecture relative to the fluid part of our breakfasts, we shall next direct your observation to the solid material, bread, and its varieties ; butter, honey, eggs, meat, fish, &c. Bread has been not unjustly named the “staff of life.” It forms so large a portion of our solid aliment that it behoves us to use all befitting caution that it shall be of the best quality. It is strange, knowing as we do, the adulterations practised by bakers, that every family at all able to accomplish so desirable an end, should not make their own bread. It would, no doubt, be more troublesome, and perhaps more expensive, than that purchased ; but we think there would be ample value received for both the additional trouble and expense caused by the domestic bakery.* In “this patent age of new inventions,” there are so many and cheap contrivances for baking, boiling, and roasting, that the fault must be left at our own doors, if we do not avail ourselves of inventions which are decided improvements. Every

* This is a custom adopted very much in England.

body knows that bread, by prolonged baking, loses a considerable portion of its weight; this necessarily induces the baker to take care that he shall not err upon the side that may endanger his batch of bread.* I heard of a baker at Kingstown who made a considerable fortune at his business, owing to selling such good bread. The public were aware that it was always light, because he took care to bake it sufficiently, and they judiciously overlooked the diminished quantity on account of the improvement thus produced in its quality. The difficulty of obtaining barm in country places may be obviated by the use of soda and buttermilk; but barm can be readily obtained from fermenting beer; or a stock of it can be laid in, as this substance may be dried and made into balls: when wanted, it should be moistened, and it will then answer as well as when obtained in the recent state.†

One of my industrious pupils has given me the following receipt for making barm, which he says answers exceedingly well:

“Take of hops one ounce, infuse them for four hours in a pint of boiling water; next, take of boiled potatoes one stone—let them be well bruised, then pour upon them two gallons of warm water and the infusion of hops; after this, strain off the fluid through a hair-sieve; finally, set this to ferment: when fermented it is fit for use.”

Bread made with barm is called “light,” while that made without it is named “heavy.” We shall briefly explain the process of panary fermentation, or the making of ordinary dough. Well, we will first say a word about

* “The average loss of weight is about one-fifth, owing to the evaporation of water.”

† Milk may be preserved by a somewhat analogous process.

that which plays so important a part in this process, is so constantly in our mouths, exhales from the lungs, and so often fizzes down our throats: it is carbonic acid gas, or fixed air. Now, when you see the cork shot out of a soda-water bottle, and you are told that it is caused by this gas, you are naturally disposed to question the propriety of calling that fixed which is so prone to escape, and does so after a very noisy fashion. It reminds you of "*lucus a non lucendo.*" This carbonic acid is, you must know, quite typical of our countrymen, when free, (a bachelor,) gaseous and volatile, light, as air—quite a rattle, as you have seen in the *so called* soda-water; but when united with an alkali (married) it becomes fixed and constant to its mate, until the alkali, by her attractive charms, allures, and finally joins, another partner, when carbonic acid gas takes his leave after his usual fizzing fashion. So you see he is constant or *fixed* until he is dispossessed or dismissed, and when turned out he is still disposed—*mirabile dictu*—to unite with the next disengaged alkali, or any susceptible daughter of earth* that he may meet in his travels.

We shall illustrate this matter by a familiar example. You are all aware of the refreshing and stomach-soothing beverage called saline effervescing mixture. Little do you think that in the very formation of this grateful draught, you are the innocent and unconscious cause of separating those (carbonic acid and alkali—soda) that nature had joined together;—but so it is. You throw upon the loving pair, mutually dissolved in each other's embrace—not the

* Lime-water, if exposed to the atmosphere, will attract carbonic acid from the latter, thus forming a pellicle of carbonate of lime on the surface—acting as an alkali, it is hence named an *alkaline earth*.

apple of discord, but the lemon of separation. And lo! the hitherto constant alkali, soda, leaves her mate, carbonic acid, and takes up with the sour intruder; (lemon juice;) the carbonic acid is driven off, turned out, but not until he enjoys a hissing triumph—for he exults even in your mouth and throat—over the newly united pair which are speedily consigned to the pit that is bottomless, namely, the alimentary canal.*

We may here observe, that if the lemon juice (citric acid) is not in excess, the compound then formed should not be in the slightest degree acid: the citrate of soda thus made is what is called a “neutral salt:” that is, the opposite qualities of the acid and alkali are both neutralized by their union. Those who are unaware of the foregoing change often object to take this useful medicine, saying that lemon juice would disagree with them. It is to be explained by remembering that *chemical* union takes place between dissimilar particles, and produces bodies possessed of new properties different from those of their components. When dissimilar particles are brought together, they will not always unite: they must have an affinity for each other. Water and oil may be placed together: they will not unite. Or we may add sugar and lemon juice to barley-water: the compound will be mere *mixture*, in which the substances are only associated without acquiring any new property; and our taste at once discovers sweetness and sourness combined. In like manner we may dissolve salt in water: this is mere solution, for the properties of the salt are the same both before and after its change of state.

* We are of opinion that popular chemistry would readily admit of being taught upon the same system that Darwin adopted in the “Loves of the Plants.”

There is some analogy in the moral world. The attributes of the mind, bad and good, may be so united in an individual as to render him a neutral character—neither “hot nor cold:” or, as we sometimes observe in wedded life, the sourness of one party will be neutralized by the bland and alkaline (not caustic) mildness of temper evinced by the other—forming a felicitous example both of conjugal union and of chemical results.

I have no doubt excited both your sympathy and curiosity concerning this carbonic acid gas. Well, although a long time in existence, and perhaps as old as Adam, (we suppose our first parent exhaled carbonic acid,) it was not recognised until Black made the discovery. It is rather a curious coincidence that charcoal, a *black* substance, should prove to be the basis of the gas. This will help to remind you of its discoverer’s name. The charcoal is united with oxygen,* in order to form carbonic acid gas. When on the subject of respiration, we shall have to explain that the latter is derived from the atmosphere, and combines with the former given off from the lungs during the act of respiration, which we shall particularly consider when on that important function. Carbonic acid plays a most useful part in the making of bread, which we shall now proceed to explain.

* The atmosphere consists chiefly of oxygen and nitrogen merely *mixed*: the former is that which supports animal life—hence called vital air. It is also a curious association that O. P. will represent the initial letters of the name of this gas and of its discoverer, Priestly—an example of direct sequence! Mnemonics, unless in such obvious instances as these referred to, will not do unless the *system* is made by *yourself*. We may designate the main constituents of the atmosphere, as well as the discoverer of the vital portion of it, by N. O. P., which indicate nitrogen, oxygen, Priestly, in alphabetical order.

Wheaten flour contains a mucilaginous saccharine matter, starch, and a peculiarly tenacious substance called gluten : during the panary fermentation, carbonic acid is developed, and from its volatile habits when free, it attempts to escape, but is restrained by the gluten which, expanding “like a membrane, forms a multitude of little cavities, which gives lightness and sponginess to the mass.” Paris adds, “we easily therefore perceive why flour, deficient in the tenacity which gluten imparts to it, is incapable of making raised bread, notwithstanding the greatest activity may be given to the fermentative process by artificial additions.”

With so much knowledge, we can now explain why soda bread “rises.” The soda is not pure, but is, as we saw in the saline mixture, united with fixed air, carbonic acid gas : when we mix the three ingredients—flour, butter-milk, and carbonate of soda, a decomposition takes place, the acid of the milk unites with the soda, and dispossesses the carbonic acid from the latter ; this gas, by attempting to escape, and being restrained by the gluten of the flour, causes the rising of the dough to take place in the manner we have just now explained. In the case of the saline effervescing mixture, the escape of the carbonic acid gas is quite palpable, as there is nothing like gluten to prevent it. ’Tis also plain, that the more acid the buttermilk is, the better will it fulfil the intention of decomposing the carbonate of soda, and thus causing an evolution of the gas. It was found by Mr. E. Davy, of Cork, that bad flour may be made into tolerable bread, by adding to each pound from twenty to forty grains of the common carbonate of magnesia. Paris states : “The operation of this substance in rendering the bread lighter, has not been satis-

factorily explained; but from my own experience of its effects, I apprehend that it neutralizes an acid which is produced during the fermentation of inferior flour, and becoming itself decomposed by the same action, gives out carbonic acid,* and thus contributes to the sponginess of the loaf. The addition of salt greatly improves the digestibility of the bread, for reasons which have been already considered."

As carbonate of magnesia (common magnesia) is a combination of the alkaline earth, magnesia, and carbonic acid, we might substitute it for carbonate of soda; for the decomposition, by means of buttermilk, or any acid (vinegar for example) would be precisely the same.† It is observed that whole-meal bread (that in which all the bran and fine flour are combined) made with soda, &c., is found most useful in regulating the bowels; the increased freedom of which has been accounted for by the mechanical or irritating action of the scales of bran upon the intestines. We find that the process of panary fermentation is generally necessary, unless for those that possess powerful digestive organs. We shall endeavour to explain this. The proximate principles of flour—gluten, starch, albumen, and sugar—will, when exposed to heat and moisture for some time, undergo fermentation, owing to these substances mutually acting upon each other. Now, if this fermentation shall not have taken place—as occurs in the

* It is plain that the acid here produced effects the same object in reference to the carbonate of magnesia, as the acid of the butter-milk does in respect to the carbonate of soda—namely, the evolution of carbonic gas.—G. T. H.

† The French have many varieties of bread, in which eggs, milk, and butter enter as ingredients. They are also in the habit of adding ammonia (hartshorn) to the dough, which, during the evaporation in the oven, raises it, and thus adds to its sponginess."—*Paris*.

case of unleavened bread—before it is eaten, the heat and moisture of the stomach will favour the tendency of such aliment to run into this process, unless counteracted by the agency of a vigorous stomach, secreting an all-powerful gastric juice. We showed before (p. 85) why vegetables caused heartburn and flatulency in those with weak powers of digestion: the same explanation applies here, for the unleavened bread, like the vegetables, owing to imperfect digestion, runs into the acetous fermentation, the product of which is carbonic acid gas (fixed air) and acetic acid,* which cause the unpleasant symptoms just mentioned.

We rarely—in those degenerate days of digestion—have the “slim” cake at tea, which was so much the fashion, and so great a favourite when we were boys—not “some forty years ago.” It was made, if we recollect aright, of flour, milk, butter, and often eggs, *without* barm—thin. We used to think when looking with “watering teeth” and anxious eye upon its surface, so nicely browning on the griddle, that it was made too thin indeed for hungry boys; but then it should be so, for it was a “slim” cake.

Well, although there are some that, like the dog and boa-constrictor, are blessed with gastric juice, that can suspend even the putrefactive fermentation; we should warn all who are not so blessed to avoid unleavened bread, for the reasons we have just assigned. It is admitted by all, that some remarkable chemical change takes place in the flour after it is baked into bread in the ordi-

* Of the unleavened sorts of bread, biscuit is by far the best; and in all cases where leavened or fermented bread does not agree, its use cannot be too strongly advocated. Paris also adds that he successfully treated several cases of acidity of the stomach by substituting biscuit for ordinary bread.

nary way, for none of the ingredients of the former can be discovered after this operation, the nature of which is not understood.

Paris states: "It appears certain that a quantity of water or its elements* is consolidated and combined with the flour; the gluten too would serve to form a union with the starch and water, and thus to give rise to a compound, upon which the nutritive qualities of bread depend." He agrees with Philip, and indeed with our ordinary experience, in proscribing new bread. "In such a state it swells like a sponge in the stomach, and proves very indigestible."

"Few things are of more difficult digestion than new bread. Everything, as may be inferred from what has been said of the process of digestion, which by mastication forms a tenacious paste, is difficult of digestion, being slowly pervaded by the gastric fluid. So difficult of digestion is such a paste, that I have known more than one dyspeptic whose stomach could only digest new bread when it was soaked in melted butter. Here one of the articles most difficult of digestion was more easily digested than the tenacious paste which its presence prevented. Even bread sufficiently old, which it never is until it is quite dry, is frequently oppressive if taken alone, and in considerable quantity. It still forms a mass not readily pervaded. The sailor's biscuit, or bread toasted until it is hard, often agrees better with a weak stomach than bread in other states."—

Philip.

We have seen, on many occasions, the foregoing observations fully borne out at breakfast, when Miss

{ * Water consists of oxygen and hydrogen.

Sally Lunn had been introduced, and was made love to by voracious votaries, with chops all besmeared with butter.

When a student of alma mater—Trinity College, Dublin—some twenty years ago, the fellows gave their pupils breakfast on the morning of entrance, and subsequently at the quarterly examinations. A little observation would enable you to determine who were the men contending for honours, who dreading cautions: suspense, anxiety, and fear, sent both of these to breakfast with diminished appetite; while the students neither looking for honours nor dreading punishment—“*in medio tutissimus ibis*”—fell to with might and main at the Sally Lunn and eggs, not having before them the slightest fear nor dread of dyspepsy.

It is reported of our present Provost, when a junior fellow, that on these Saturnalian occasions, he used to say: “Lads, if your tea be not sweet enough, there’s *plenty* of *sugar*.” While “a *Fellow*” that shall be nameless—*de mortuis nil nisi bonum**—used to address his pupils thus: “Gentlemen, if your tea should not be sufficiently sweet, be good enough to *stir it*.” Was it in compliance with the dying request of *this fellow*, who had a mortal aversion to mischievous and meretricious Sally Lunn and sweet tea, that these College breakfasts were abolished, which brought so frequently tutor and pupil together in social and friendly relation?—*verbum sap.*

In the preface to Dr. Kitchiner’s *Cook’s Oracle*, he

* “When a rascal dies let all bemoan him.”—*Brenan*.

If the facetious and satirical doctor were alive—God be good to him poor sinner—he would no doubt say in *this* case:

“Worth makes the man, and want of *it the fellow*;
The rest is all but leather or pruncilla.”

states that, "it has been his aim to render food acceptable to the palate without being expensive to the purse or offensive to the stomach—nourishing without being inflammatory, and savoury without being surfeiting, constantly endeavouring to hold the balance even between the agreeable and the wholesome, the epicure and the economist." Again he adds: "the author has submitted to a labour no preceding cookery-book-maker perhaps ever attempted to encounter—having *eaten each receipt* before he set it down in his book."* After such an assurance from so renowned an author in culinary matters, I think we do the "state good service" by extracting from the "*Oracle*" the following receipts for the information of inexperienced housekeepers and cooks, as to the best mode of making bread, &c. &c. :

"*Bread.*—Put a quartern of flour into a large basin, with two tea-spoonsful of salt; make a hole in the middle; then put in a basin four table-spoonsful of good yeast; stir in a pint of milk lukewarm; put it in the hole of the flour;

* It would appear that the Doctor himself must be blessed with powerful digestion! We hope that the receipts were not written on *parchment*. In the country parts of the "kingdom called Ireland," persons "suspected of debt" are said to be obnoxious to certain things called *latitats*. (Which suppose that the defendant doth lurk and lie hid.) A process-server, if not successful in his retreat from the "Wilds," is generally compelled to eat both copy and original, to test his digestive powers, with a dreadful drubbing to boot to try the soundness of his flesh and strength of his bones. You may perceive that the Irish peasantry have always manifested a taste for *practical* physiology, by thus experimenting upon the organs of digestion and those of loco-motion, both active and passive, viz.—muscle and bone. An indulgence in this propensity would appear to constitute one of the "Wild Sports of the West." Connaught has been proverbially given to "*larning*." The "Boys" read Horace, and profit by his rule—*utile dulce*!

stir it just to make it of a thin batter ; then strew a little flour over the top ; then set it on one side of the fire, and cover it over ; let it stand till the next morning ; then make it into dough ; add half a pint more of warm milk ; knead it for ten minutes, and then set it in a warm place by the fire for one hour and-a-half ; then knead it again, and it is ready for loaves or brieks ; bake them from one hour and-a-half to two hours, according to the size.

French bread and rolls.—Take a pint and-a-half of milk ; make it quite warm ; half a pint of small beer yeast ; add sufficient flour to make it as thick as batter ; put it into a pan ; cover it over, and keep it warm ; when it has risen as high as it will, add a quarter of a pint of warm water and half an ounce of salt ; mix them well together ; rub into a little flour two ounces of butter ; then make your dough not quite so stiff as for your bread ; let it stand for three quarters of an hour, and it will be ready to make into rolls, &c. ; let them stand till they have risen, and bake them in a quick oven.

Sally Lunn ; tea-cakes.—Take one pint of milk quite warm, a quarter of a pint of thick small-beer yeast ; put them into a pan with flour sufficient to make it as thick as batter ; cover it over, and let it stand till it has risen as high as it will, *i. e.* about two hours ; add two ounces of lump-sugar, dissolved in a quarter of a pint of warm milk,* a quarter of a pound of butter rubbed into your flour very fine ; then make your dough the same as for French rolls, &c. ; let it stand half an hour ; then make up your cakes, and put them on tins ; when they have stood to rise, bake them in a quick oven. Care should be taken never

* “ If you do not mind the expense, the cake will be much lighter if, instead of the milk, you put four eggs.”

to put your yeast to water or milk too hot or too cold, as either extreme will destroy the fermentation. In summer it should be lukewarm; in winter a little warmer; and in very cold weather, warmer still. When it has first risen, if you are not prepared, it will not hurt to stand an hour.

Muffins.—Take one pint of milk quite warm, and a quarter of a pint of thick small-beer yeast; strain them into a pan, and add sufficient flour to make it like a batter; cover it over, and let it stand in a warm place until it has risen; then add a quarter of a pint of warm milk, and one ounce of butter rubbed in some flour quite fine; mix them well together, then add sufficient flour to make into dough; cover it over, and let it stand half an hour; then work it up again, and break it into small pieces; roll them quite round, and cover them over for a quarter of an hour; then bake them.

Crumpits.—The same: instead of making the mixture into dough, add only sufficient flour to make a thick batter, and when it has stood a quarter of an hour, it will be ready to bake. Muffins and crumpets bake best in a stove, with an iron plate fixed on the top; but they will also bake in a frying pan, taking care the fire is not too fierce, and turning them when lightly browned.

Yorkshire cakes.—Take a pint and-a-half of milk quite warm, a quarter of a pint of thick small-beer yeast; mix them well together in a pan, with sufficient flour to make a thick batter; let it stand in a warm place, covered over until it has risen as high as it will; rub six ounces of butter into some flour till it is quite fine; then break three eggs into your pan with the flour and butter; mix them well together; then add sufficient flour to make it into dough, and let it stand a quarter of an hour; then work it up again, and break it into pieces about the size of an egg, or

larger, as you may fancy; roll them round and smooth with your hand, and put them on tins, and let them stand covered over with a light piece of flannel.

These six receipts were written by Mr. Turner, bread and biscuit baker, corner of London and Fitzroy-street, Fitzroy-square."

In Beaumont's experiments (p. 99) it was found that fresh bread took three hours for its digestion, while stale bread was chymified in two. Fresh rolls, Sally Lunn, and toast, saturated with city butter, are of course an abomination, more especially when eaten at a temperature many degrees above that of the body. Notwithstanding all this, you must ever bear in mind the importance of consulting the taste of the individual—the liking. There is a remarkable analogy in this respect between the moral and the physical world; for although in reference to the former we may be fully conscious of the faults, failings, and frailties of a certain individual, yet we cannot help liking, loving, and patiently tolerating in him what in the truly good or less faulty—but not liked or loved*—we are unprepared to bear—reminding us of the strong and natural burst of impassioned feeling expressed in *Sonnambula*, "False one, I love thee still." In relation to the stomach, we find that although certain aliments are to be esteemed unwholesome, or in ordinary, difficult of digestion, yet if they are eaten with a decided liking, it is surprising how rarely they disagree with this organ. The richly buttered toast and Sally Lunn, to which we may add the "collop" of bacon, (p. 99,) sometimes named a "relish"—and not inaptly—as it induces us to eat—are all digested; when

* "Why—I cannot tell,
But I do not love you, Dr. Bell."

stale bread, dry toast, and wholesome mutton got down—*nolens volens*, or with dislike—are chymified with difficulty. If after eating any aliment, even with a relish, we learn that it has been cooked by some one not remarkable for cleanly habits, or by one usually engaged in filthy occupations, the function of the stomach is suspended; and in one instance that we witnessed, the disgust excited was so great as to cause the return of the suspected food. It is well that we are kept in such blissful ignorance of the functionaries engaged in the kitchen, the bakery and the dairy. “What the eye and the ear do not see or hear, the heart and stomach doth not grieve at.”

Paris relates a striking instance of the powers of imagination in this respect. A Cambridge student called upon a friend, and observed a glass of sherry on his table, which he immediately swallowed; the gentleman, in whose apartment this occurred, determined to play off a hoax upon his visitor, and turning towards him the label of a half-pint bottle of autimonial* wine, declared that he had swallowed a portion of its contents. The student left the room, and instantly vomited. These facts show in a striking manner to what an extent the digestive organs are influenced by the nervous system; and were it not otherwise obvious, they would point out the vast importance of serenity and cheerfulness during the discharge of their functions.

“Unquiet meals make ill digestion.”

We are quite certain you will receive the following quotations from Dr. Johnson’s *Medico-Chirurgical*

* Solution of tartar emetic.

Review, for October, 1841, with the same gratification that they were read by me ; and that you will doubtless not be displeased on this occasion, at our digressing from the subject of breakfast, while I hold such a journal in my hand ; the author of which so uniformly unites in a manner } peculiarly felicitous the *utile dulce*. I need scarcely add that we coincide fully and entirely with the views given by the learned author of the essay, and his admirable and talented reviewer. Although the following observations might be postponed until we came more especially to consider the functions of the mind, yet still as body and soul are so united that we cannot proceed a single step with either without involving the consideration of the other, the sooner we shall have placed before you the leading moral influences which affect the several organs, the more readily will you comprehend the mutual action and reaction of body and mind ; and besides the functions considered in this essay, embrace those which, as we have shown at page 126, are directly concerned in the end in view, namely—nutrition. We had contemplated at first making but a few extracts from the review ; but as the whole article is so brief, interesting, and valuable, we shall give it as found in the journal. The parts marked in inverted commas are the observations of the French writer ; those not so designated are Dr. Johnson's. Any explanation or matter that I think may be added for general readers will be found included within brackets, []. Having premised so much, we shall at once proceed to this interesting subject, which is headed

ON MORAL THERAPEUTICS.

M. Reveillé-Parise is, we believe, well known in Paris

as an accomplished and highly literary physician. He is one of the Secretaries of the Royal Academy; and we have observed that, on more than one occasion, he has been solicited to pronounce the funeral *éloge* over some distinguished son of science. He has recently published, in one of the French periodicals, an elegant Essay on Moral Therapeutics, or the influence which the mind and passions exercise in the production and cure of various diseases. It is certainly a good subject for a medical theme, affording ample scope alike for the observations of the practical physician and the reflections of the thoughtful scholar. It was the remark of Napoleon that, in war, the moral are to the physical means as three to one—so highly did that consummate general rate the influence of mere mind on the issue of any great military enterprise. Now the same will often be found to hold good in the more peaceful operations of the healing art.

[It was observed that the officers engaged in the last war bore the fatigue, hardships, and privations inseparable from a campaign, at least as well, if not better, than the soldiery, although the former were in many instances the elite of the land; reared in the lap of luxury, with all the care and downy comfort which ingenuity or wealth could devise or afford. How are we to account for this elastic endurance of unwonted bodily suffering? We are to find its explanation by reference to the mind, which has now its turn. I have already shown (p. 143) that the state of the corporeal functions influences to a humiliating extent the moral portion of our being: you have here to look at the converse of the proposition; the body now is enabled to endure the most unusual suffering, by the aid of the

attributes of mind, call that agency and those attributes what you will, which are the secret springs of human actions, and of man's endurance.

Life's smallest miseries are perhaps its worst:
 Great sufferings have great strength: there is a pride
 In the bold energy that braves the worst,
 And bears proud in the bearing; but the heart
 Consumes with those small sorrows, and small shame,
 Which crave, yet cannot ask for sympathy:
 They blush that they exist, and yet how keen
 The pang that they inflict. —L. E. L.

Shall we call this supporting spirit, pride or patience—emulation or energy. It is easy to assign the final cause, that “God fits the back to the burden, and tempers the wind to the shorn lamb;” but it is not so easy to name that attribute which is the offspring of God's grace. We will venture to call this divine essence—enthusiasm, without which there is no greatness of character. It is the elevating principle of the best—the highest aspirations alike of religion, of morals, and of intellect.

We speak now, remember, of enthusiasm, in its best acceptation, which Johnson, our great lexicographer, defines to be “elevation of fancy, exaltation of ideas.”

.....“At last sublim'd
 To rapture and *enthusiastic* heat
 We feel the present deity.”—*Thomson*.

We have already (p. 127) alluded to this attribute. I cannot resist the present opportunity of putting before you our notions in reference to the extensive range of its application.

[The fondest thing in nature—the most disinterestedly fond—is a mother of her offspring : this, generally, is alike true amongst all tribes of animals, as we are fully prepared, from experience, to admit. It is equally true that the end of existence is enjoyment ; consequently, pleasure and pain should be the most operative and influential agents, in inducing us to pursue and persevere upon the one hand, and to decline and desist on the other.

Do but balance these—pleasure and pain—in the scale of an anxious mother's existence ; how much will the latter preponderate ? Yet, observe, how an occasional transient gleam of sunshine, shed over the pallid countenance of the sickly but smiling child, lights up the mother's care-worn countenance with the radiance of hope and joy, which repays her for days and nights—nay, months and years, of devoted solicitude and harrassing watching. It is obvious that reason is not the uplifting influence here : the soul-supporting spirit is instinctive, absorbing love—"less akin to earth than heaven"—which inspires that exalted train of ideas we so justly call the enthusiasm of the mother.

Observe, in the next instance, the child—the mere child—its young mind expanding—bursting into beauty like the opening bud under the sun's vernal influence. Its nature ardent, generous, so innocent, so unsuspecting : its extacy to caress and be caressed. The lively senses that drink in with eager thirst, the things of outward world—all delightful, because they are gilded by the sunny light of fairy fancy and bright enthusiasm.

In riper years—in manhood—what marks the man of genius—what the man of soul ! What raises him above the vulgar herd ! What elevates him so high above the heads of those who are merely rich in pelf, but, poor indeed in worth ! What gives the fire to music, to poetry,

and to thought! What makes the great be good, the good be great! Shall we not call that spirit divine enthusiasm?

In the heart's affection! where shall we look for the secret subtle essence—the thrilling soul-felt influence, which makes woman a spirit of light and loveliness? That sheds a hallowed atmosphere of “sainted chastity” around her, and bids man almost worship the idol object of his love? Is it not because her thoughts—her feelings—her sentiments—are the purer offspring and the brighter emanation of an unshackled enthusiasm.

Finally; should we not cherish then, this glorious attribute—the parent of all that's good, that's great, that's noble, and that's generous: the blessed emanation of divinity itself: that teaches ransomed man to rise above his fallen self, and proudly feel how grovelling and unsatisfying are things of earth; and bids the imprisoned and anxious eye of Time to look to Heaven and to Eternity for the enjoyment of unalloyed enthusiasm.]

It is by studying the mind, the feelings, and passions of his patients with more than usual tenderness and sagacity, that one physician so often outstrips another in the extent and success of practice. We believe that the want of such a study is apt to be a besetting sin of those medical men more especially, who have been long occupied with hospital practice. M. Parise very pertinently remarks on this subject, that “patients in these institutions are almost quite unknown to the physician, and the physician to the patients; when they are once discharged, they are completely forgotten; there is no unbosoming of the heart either attempted on the one side, or encouraged on the other. The patient suffers, or is cured—dies, or leaves the hospital, bearing within his own breast the arrow that has wounded his feel-

ings, and which has been the cause of the disturbed equilibrium of his bodily functions."

[We made the following observations on a former occasion, which may not be inaptly introduced here :

From the picture I have drawn, the moral requisite, most necessary, is, a strict observance of the golden rule of practice: "*And as you would that men should do to you, do ye also to them likewise.*" This is the grand and sure guide, whether in relation to your professional brethren—to patients, or the every-day concerns of life. This is the powerful soul-searching corrective—the simple moral test—which makes that innate, predominant love of self, the measure of the love we should bear to our neighbour.

From this parent virtue will flow that kindness of manner, that benevolence of purpose, which warms the heart of the poor sinking patient, and raises his drooping and desponding spirits; while it withholds every thought, word or act, that might, by possibility, tend to injure or disserve, in the remotest degree, our professional brethren.

The exercise of this Christian virtue will shed a halloved lustre around you. It will bring with it the most consolitary feelings under the most trying circumstances; and, if you should err, which is not at all probable, the error must be esteemed one of the head, not of the heart. Again, it is the parent of energy, patience, and perseverance, attributes so essential in the discharge of our professional duties.

I shall beg to convey one of you, my young friends, to the bedside of a poor patient in hospital. A contagious fever separates him from all he holds dear—his home, his family. Feel his throbbing temples—his burning forehead; observe his flushed cheek and suffused eye; mark

how he anxiously looks to you as the ministering angel of health and comfort.

Fancy yourself in his position, and he converted into the physician ; and I will make no doubt you will require him to feel *such* an *interest* in your case as will excite all his best energies—draw largely on his patience—and induce him to persevere constantly until he shall have discovered and removed the cause of your malady.

Dr. Abererombie, in speaking of imagination, says : “ The sound and proper exercise of it may be made to contribute to the cultivation of all that is virtuous and estimable in human character. It leads us in particular to place ourselves in the situation of others, to enter into their feelings and wants, and to participate in their distresses. It thus tends to the cultivation of sympathy and the benevolent affections ; and promotes all those feelings which exert so extensive an influence in the duties of friendship and the harmonies of civil and social intercourse.

We may even say that we exercise imagination when we endeavour to act upon that high standard of morals which requires us “ to do to others as we would that they should do unto us.” For in this mental act we must imagine ourselves in the situation of other men, and, in their character, judge of our own conduct towards them. Thus a man deficient in imagination, though he may be free from anything unjust or dishonourable, is apt to be cold, contracted, and selfish ; regardless of the feelings, and indifferent to the distresses of others.”]

There cannot be a doubt but that psychological causes of disease are too apt to be entirely overlooked in the present day, and that physicians, in their minute examination of all the physical symptoms of a malady, often

overlook the influence of mental emotions on its development, its progress, and its termination. "If a patient dies," says M. Parise, "we open his body, rummage among the viscera, and scrutinize most narrowly all the organs and tissues, in the hope of discovering lessons of some one sort or another: there is not a small vessel, membrane, cavity, or follicle, which is not attentively examined: the colour, the weight, the thickness, the volume, the alteration—nothing escapes the eyes of the studious anatomist. He handles, touches, smells, and looks at every thing; then he draws his conclusions one way or the other. One thing only escapes his attention: this is, that he is looking at merely organic effects, forgetting all the while that he must mount higher up to discover their causes. These organic alterations are observed, perhaps, in the body of a person who has suffered deeply from mental distress and anxiety: these have been the energetic cause of his decay, but they cannot be studied in the laboratory or in the amphitheatre.".....

"Many physicians of extensive experience are destitute of the ability of searching out and understanding the moral causes of disease: they cannot read the book of the heart; and yet it is in this book that are inscribed, day by day, and hour by hour, all the griefs, and all the miseries, and all the vanities, and all the fears, and all the joys, and all the hopes of man, and in which will be found the most active and incessant principle of that frightful series of organic changes which constitute pathology."

This is quite true: whenever the equilibrium of our moral nature is long or very seriously disturbed, we may rest assured that that of the animal functions will suffer.

Many a disease is the *contre-coup*, so to speak, of a strong

moral emotion: the mischief may not be apparent at the time, but its germ will be nevertheless inevitably laid.

“An aneurism of the heart, an engorgement of the liver, a schirrus of the pylorus, an effusion on the brain, or a softening of some point of its substance, typhoid fever, and the majority of what are called nervous diseases—proceed more or less directly from some, perhaps forgotten grief, but which, *velut spina in corde*, to use the words of Hippocrates, has gradually destroyed the springs of the living economy. Can we doubt but that it was concentrated chagrin that was the vulture which preyed upon the vitals of Napoleon on the rock of St. Helena?”

It is, indeed, often very difficult to trace distinctly the relation between the cause and the effect, except, perhaps, in our own individual cases, or in those of our immediate friends. But where is the medical man that could not tell many a story of the workings of the mind in unhinging the machinery of the body? His own personal experience probably might furnish him with many such a lesson.

And perhaps our author does not much exaggerate the influence of mental causes when he says, that “deep and protracted distress of mind is the *point de depart* of the greater number of organic diseases.* The learned Mœringhen has very justly observed: *Vix ullus reperitur morbus, cui non aliquod animi pathema, vel ansam, vel incrementum, vel remedium dederit*—an axiom as true as it is pregnant with practical results.”

[Can it now be said that the medical attendant has nothing

* John Hunter attributed the disease of the heart, of which he ultimately died, after many years suffering, to the fear of having caught the hydrophobic virus while dissecting the body of a patient who had died of rabies.—Rev.

to do with the miseries, the follies, and the fashions of the day? That he should not desire to pass behind the curtain and the scenes; for this would be to pry into domestic affairs? That he should disregard alike the vanities, the griefs, the cares—"the gnawing of the worm that dieth not, and of the fire that is never quencheth;" forsooth, because his inquiries may be esteemed misplaced or obtrusive? the offspring of curiosity, and not of pure and hallowed sympathy! Need I say that we think far otherwise. But indeed confidence should be always sought from the sufferer with the most cautious kindness; "for with a soul that ever felt the sting of sorrow, sorrow is a sacred thing."

Great confidence is usually reposed in the profession at large, but more particularly so in obstetric practice. The reputation of many, in very numerous instances, depends on the secrecy of the physician: communications with him are to be esteemed as confessions, the unwarranted disclosure of which should justly stigmatize the betrayer, as a disgrace to the profession.

We must not then confine within narrow limits the comprehensive duties of the physician, who is conscientiously bound, not only to point out the mode by which disease is to be treated, but also to *explain* the advantages to be obtained by a strict attention to the state of the mind, and to the *rules of prevention*; the value of which must be esteemed of paramount importance. Hence the necessity of closely attending to every circumstance connected with the moral and physical development of man.

The study of human nature, in all its varied aspects, is amongst the first requisites of a good physician, more especially of him who practises much amongst females and children. When fully aware of the reciprocal influence of mind and body, we can readily account for the apparently

inexplicable connection between the corporeal and mental portions of our being.

The influence of the state of mind over the functions of the body may be proved by a thousand instances. We shall mention some remarkable ones as examples. I was called upon to attend a lady in her confinement, in consequence of the absence of her ordinary medical attendant. On hearing that a stranger was his substitute, the pains which had been previously well marked and regular, completely ceased ; and it was not until she had been assured that her medical friend would soon be with her, and that I was perfectly competent to act in his place, that tranquillity was restored, and the pains were renewed.

It is a well known circumstance that the mere sight of the dentist and his formidable instruments often banishes tooth-ache. We heard of a gentleman whose wife had disappointed her dentist on several occasions, owing to this cause. The economical husband having no notion that the tooth-extractor should be always paid for the mere exhibition of his pain-banishing instruments, finally, sat down and had one of his suspected but painless teeth pulled, as a sort of value received for the dentist's fee.

We have already (p. 131) alluded to the joyous and buoyant days of boyhood. Association of ideas has a powerful effect in reviving latent impressions ; indeed with an influence so great as actually to cause or remove, in some instances, disease itself.

A lady of our acquaintance had suffered so much from typhus fever, that it nearly proved fatal. After her recovery, she saw the fever cart pass by, and was instantly seized with headache, sick stomach, and shivering, which terminated in a second attack of fever, but not so severe as the first.

Van Swieten relates of himself that he was passing a spot where the dead body of a dog had burst, and produced such a stench as made him vomit ; and that happening to pass the same spot some years after, he was affected by sickness and vomiting from the recollection.

The influence of association of ideas in removing disease will be illustrated by the following anecdote, narrated by Dr. Rush :

“ During the time that I passed at a country school, in Cecil county, in Maryland, I often went on a holiday, with my schoolmates, to see an eagle’s nest upon the summit of a dead tree, in the neighbourhood of the school, during the time of the incubation of the bird. The daughter of the farmer, in whose field the tree stood, and with whom I became acquainted, married, and settled in this city about forty years ago. In our occasional interviews, we now and then spoke of the innocent haunts and rural pleasures of our youth, and among others, of the eagle’s nest in her father’s field. A few years ago, I was called to visit this woman, when she was in the lowest stage of typhus fever. Upon entering the room, I caught her eye, and, with a cheerful tone of voice, said only, *the eagle’s nest*. She seized my hand, without being able to speak, and discovered strong emotions of pleasure in her countenance ; probably from a sudden association of all her early domestic connexions and enjoyments with the words which I uttered. From that time she began to recover. She is now living, and seldom fails, when we meet, to salute me with the echo of the ‘ eagle’s nest.’ ”

An eminent physician of this city, no less distinguished for his talents and acquirements than for his high mindedness and benevolence, attended, when cholera was epidemic in Dublin, a young and interesting foreign lady of rank.

She was a stranger—separated from home, family, and country—need I say her physician felt, deeply felt, for his patient. The disease proved fatal. This gentleman mentioned that he could never after enter the room, which was the scene of her sufferings and of her death. The cause of this is well explained by Dr. Abercrombie in the following terms :

“ These mere local associations, however, often make a very deep impression upon the mind ; more vivid certainly than simple memory of the facts or transactions connected with them. Thus, we avoid a place* which is associated with some painful recollection ; yet the very fact of avoiding it shows that we have a full remembrance of the circumstances, and, at the same time, a conviction that the sight of the spot would make the impression more vivid and more painful. After the death of a beloved child or a much valued friend, we may retain a lively remembrance of them, and even anxiously cherish the impression of their endearing qualities : yet, after time has in some measure blunted the acuteness of feeling, the accidental discovery of some trifling memorial, strongly associated with the lamented object of our affection, produces a freshness and intensity of emotion known only to those who have experienced it. This feeling is peculiarly strong if the memorial has been long lost sight of, and discovered by accident.”

We shall present you with another instance of the powerful influence of association of ideas which will make

* [“ A burned child dreads the fire.” It used to be the custom to condemn criminals to suffer on the very spot where the crime had been committed. The law no doubt contemplated that this sentence would aggravate the punishment. For here are associated in the mind of the wretched culprit the place, crime, and capital penalty.]

its way to the heart of every parent, more especially of her that has been bereaved of the youthful object of her cherished affections—of her *enthusiastic* love.

“I do not think there is any thing in the world more pleasing than the ideas awakened in the heart of a mother, by the sight of the little shoe of her child : above all, if it be a holiday, a Sunday, a baptismal shoe ; a shoe embroidered to the sole ; a shoe in which the child has not yet made one step. This shoe has so much little prettiness about it ; it is so impossible for it to walk, that it seems to the mother as if she saw her child. She smiles on it, laughs at it, kisses it. She asks it, if it be possible that the foot is so little. And if the child be absent, the pretty shoe is sufficient to conjure up before her the sweet and fragile babe. She thinks she sees it—she does see it—living, joyous, with its delicate hands, round head, pure lips, and its serene eyes, of which the white is blue. The little shoe sets the child before the mother in all attitudes and pursuits.

But, when the child is lost, these thousand images of joy, of tenderness, of delight, which press around the little shoe, become so many horrible things.* The pretty little embroidered shoe is no more than an instrument of torture, which eternally lacerates the heart of the mother. It is always the same fibre which vibrates, the fibre the most profound and the most sensitive ; but in place of an angel caressing the parent, it is a demon torturing her. One morning, whilst a May sun rose in the blue heavens, the recluse of the Tour-Roland heard a noise of wheels, of horses, and the clanking of iron in the

* [Hence the necessity of avoiding, under such circumstances, everything, and every place, associated with the departed, when they are beloved.]

Place de Greve. She paid small attention to it, bound her hair over her ears, to shut it out, and turned anew to contemplate on her knees the inanimate object that she had adored for fifteen years. This little shoe was, as we have already said, the universe to her. Her thoughts were wholly engrossed with it. Never had more despair been poured forth over an object more sweet and pretty. This morning her grief burst forth more violently than usual; and she could be heard by those without pouring forth her lamentations in a high and monotonous tone, which pierced every heart.”—*Victor Hugo*.

We copy the following foot-note from the last work (“*Rambling Recollections*”) of our talented countryman, W. H. Maxwell. It will be found in the “*Condemned Soldier*”—a story of thrilling interest.

“A gentleman who had been active in vain endeavours to obtain a mitigation of Major Campbell’s punishment, was standing at his own hall-door at a considerable distance from the place of execution. Just as the drop fell, the soldiery, annoyed by the pressure of the crowd, wheeled suddenly round, and presented their bayonets, as if about to charge. A wild panic seized the multitude, and a cry arose that ‘the soldiers were about to fire.’ On hearing the alarm, those on the outside of the crowd rushed from the scene in affright, proclaiming, as they hurried towards their homes, that ‘the soldiers were firing on the people, and a number were already slain.’ The effect upon the gentleman alluded to was singular. He heard distinctly the volleys of the soldiery, and that, too, at the regular intervals when muskets could have time to be reloaded. *The whole was imaginary*—not a shot was fired; but he declares that the illusion was so strong, that the volleys were as distinctly delivered as they had been when the regiment had been inspected.”

We are disposed to reduce this false perception to association. An estimable friend, endowed with the most exquisite sensibility, lost a beloved relative. The former told me, that on one occasion, she heard so distinctly her name called, by the "departed one," while in the loneliness and the stillness of night, that she had to fly from her bed-room to remove the harrowing illusion which produced all the conviction of reality; owing, no doubt, to its association with a train of ideas, that, in despite of every effort, memory had brought back with all the freshness, feeling, and certainty of a present event.

In the instance quoted, it is plain that such a train of circumstances, of a very likely character, might naturally have led to the conviction, that a rescue of the ill-fated Major Campbell had been attempted, or that the people had been fired upon. This being the case, the illusion, in relation to the sense of hearing, was, as it were, superinduced upon a predisposed sense: a phenomenon precisely analogous is well known to happen frequently with respect to vision.* The perception produced by association was vivid and correct as to the delivery of the volleys; because he clearly recollected how this had been done on the

* Dr. Abercrombie states: "A gentleman of an irritable habit, and liable to a variety of uneasy sensations in his head, was sitting alone in his dining-room, in the twilight, the door of the room being a little open. He saw distinctly a female figure enter, wrapped in a mantle, and the face concealed by a large black bonnet. She seemed to advance a few steps towards him, and then stop. He had a full conviction that the figure was an illusion of vision, and amused himself for some time by watching it; at the same time observing that he could see through the figure, so as to perceive the lock of the door and other objects behind it. At length when he moved his body a little forward, it disappeared." Persons of weak or disturbed mind often believe that these illusions have a real existence—hence ghost stories, and so forth. 'Tis obvious that the illusion was here detected by the very sense which had produced the false perception, for he saw through the figure the objects behind it.

inspection of the regiment, and of which circumstance he had also been an eye and *ear* witness.

The senses sometimes deceive the mind ; here the mind, owing to association, imposed upon the sense of hearing. This would be, in fact, dreaming with our eyes open, if we were not able to discover that it had been a mere illusion. What delightful and harmonious music do we hear in dreams ! “ Oft in the stilly night, when slumber’s chain is round us ; ” and the reign of fancy usurps, for a season, that of reason and of judgment.

The following extract will go to strengthen the opinion that the report of the flying and affrighted crowd was correct, for Campbell lived in the hearts of the soldiery : their conduct also affords another specimen and proof, if such were required, of what man may be brought to by discipline and habit—call it *duty*, and what will not the soldier do ?

“ It was a curious incident attendant on this melancholy event, that the 42nd regiment, with whom he had served in Egypt, then garrisoned the town ; and that the same men whom Campbell had led to a bayonet charge against the Invincibles of Napoleon, formed the gaol guard that witnessed his execution. The feelings of the Highlanders, when drawn out to witness the ignominious end of their lion-hearted comrade, were indescribable. When the sufferer appeared at the fatal door, a yell of anguish pealed along the ranks, and every bonnet was removed. Campbell addressed a few words to them in Gaelic, and instantly every face was upturned to heaven ; every cheek was bathed in tears ; every lip uttered a prayer for mercy at the judgment seat ; and when the board, descending with thundering violence, announced the moment of dissolution, the fearful groan that burst from the excited soldiery will never be forgotten.”

LECTURE VII.

We must all give our assent to the aphorism that }
“ Faith works wonders,” and that this is alike true in the }
religions, moral, and physical worlds.

The following is a remarkable instance of the effects produced by the influence of faith or confidence in a remedy :

Several years ago we were called to see a gentleman a }
few miles out of town, who had been seized with an attack }
of ordinary cholera, which was then prevailing in that }
neighbourhood. The spasms of the muscles of his legs }
were very distressing. On returning the next day, he was }
almost quite well. We were about to attribute, as usual, }
the convalescence of our patient to the antispasmodics, &c., }
directed for him ; when he honestly mentioned that imme- }
diately after my departure an old woman came to the house, }
that had cured several cases with a very simple remedy ; }
which was nothing more nor less than two large pieces of }
cane-brimstone. The patient was to grasp these tightly }
in each hand, whenever sickness of stomach or cramps }
invaded him. This gentleman thought there could be no }
harm in trying so simple a remedy ; and the result was }
that before the medicines arrived, which I had directed, the }
potent cane-brimstone had effected a cure. You will per- }
ceive how necessary it is to inquire, whether or not the }
medicines you had prescribed were taken, before you con- }
gratulate yourself and the patient upon his recovery—*post* }
hoc, propter hoc. I need scarcely add that the impression }
made upon the mind of this gentleman, by the favourable re- }
port received of the efficacy of the cane-brimstone in similar }

cases, was the real charm and secret of the remedy, and that it operated upon one not indisposed to *credulity*—the besetting sin of our nature.

Doctor Brigham* remarks, that not only will mental attention aggravate, but it will also relieve disease. Kant was able to forget, by the strength of *thought*, the pains of gout and other diseases. The mental effort, he says, required great energy of the will, and caused the blood to rush to his head, but never failed to afford relief.

The influence of the mind—of mental emotion, in causing and curing disease, are altogether too much disregarded by medical men. While grief, fear,† remorse, are as depressing as any measures we ever resort to, hope and faith‡ are more powerful tonics than bark and wine. Innumerable are the instances that might be adduced in proof of this. Let the following suffice. When the plague raged in Messina, in 1743, the 2nd of July, the Tutelar Deity (Holy Mary, Mother of God) was taken down and

* Medico-Chirurgical Review, October 1841.

† [The most powerful opposition is afforded by the spasmodic action of muscles to the replacement of a dislocated bone. An eminent surgeon of this city—observing that a gentleman had dislocated his shoulder by a fall from a horse—ordered his servant, in the hearing of the patient, to provide four strong men for the purpose of pulling the arm into its place; while the poor gentleman was anxiously quaking with fear, contemplating the dragging he should get from four lusty fellows, his surgeon, availing himself of the impression thus made, affected merely to examine the shoulder; and while the almost fainting patient was quite unaware of the intention, the adroit practitioner, by a dexterous manœuvre—taking both the patient and his muscles by surprise—restored the bone in an instant to its natural position.

‡ The late Dr. Johnson of this city (a man of no mean ability and observation) was in the habit of asking his patients, “Don’t thee think I shall cure thee?” and if answered in the affirmative, he was sure to make a more favourable prognosis.]

{ carried in procession through the city. The plague stopped immediately.*

In the life of Lord Chief Justice Holt, says Armstrong, a curious anecdote is recorded. When a young man, Holt had a flow of animal spirits which could not be well restrained, and he happened on one occasion, with some companions, to stop at an inn in the country, where they contracted a debt of such amount that they were unable to defray it. In this dilemma they appealed to Holt to get them out of the scrape. Holt observed that the innkeeper's daughter looked remarkably ill, and was told by her father she had an ague. Hereupon he gathered several plants, and mixed them together with a great deal of ceremony; afterwards wrapping them in a piece of parchment, upon which he had scrawled certain letters and marks. The ball thus prepared, he hung about the young woman's neck, and the ague did not return. After this, the never-failing doctor offered to discharge the bill, but the gratitude of the landlord refused any such thing, and Holt and his companions departed. When he became Lord Chief Justice, a woman was brought before him accused of being a witch. She was the last person tried in England for witchcraft. She made no other defence than that she was in possession of a certain ball which infallibly cured ague. The ball was handed up to the judge, who untied it, and found it to be the same identical ball which he had made

* [The great apostle of temperance, the Very Rev. T. Mathew, although he repudiated the notion, was esteemed by the superstitious to possess the virtue of curing disease. The superstition manifested by the unenlightened in this case, was, as he justly observed, but as "dust in the balance," compared with the moral good resulting from total abstinence. His allusion to the parable of the wheat and the tares, was a happy and correct illustration of the whole matter.]

in his youthful days for the purpose of curing the woman's ague and paying his own bill.

Doctor Brigham collects several cases illustrative of the effects of mental excitement and depression. The following is a very remarkable one :

The late Mr. Pott was called in consultation on a surgical case : he examined the person, ascertained the disease, and abruptly said, I congratulate you on having your complaint perfectly known, for you may be cured by an operation. He observed a remarkable change in the patient's countenance, and having left him, went home. His assistant called in the evening and found the man dead.]

1. The organ which is most apt to be affected by mental and moral causes is assuredly the *brain*. We cannot indeed point out the connection between the mind and the body, nor explain how they should act and re-act on each other : yet the fact is obvious, every hour that we live. It may puzzle, indeed, the philosopher to understand how it happens that an idea, an entity that is altogether metaphysical, invisible, intangible, without extension or form, or weight, should nevertheless act with such force on the body as to prostrate and destroy the stoutest frame. Yet so it is. Take the case of a man who learns that 2000 miles off a vessel, which holds all his fortune, is wrecked, or that an only child has died : nothing touches him—nothing directly affects his body, but the iron has entered his soul ; and soon, nay, almost immediately, are the effects of the mental anguish visible in his outward constitution. He experiences a violent, electric-like commotion that shakes every organ of his body : he trembles all over, and feels dizzy in his head : a fixed, deep-seated pain, is felt there, that robs him of sleep, and chases all his appetite away ; and, if nothing is done to relieve him, inflam-

mation of the membranes of the brain, or encephaloid congestion, or apoplexy, or palsy, or softening of the brain, or some other fatal mischief, is more or less quickly induced.

2. The *stomach* is the organ, after the brain, most apt to suffer from mental disquietude. The first effect of a deep grief, or even of a sudden and extreme joy, is to suspend the appetite and interrupt the digestive process.* This disturbance of the gastric functions is owing to a lesion of the sensory and contractile powers of the stomach, in consequence of the irregularity of its innervation or supply of nervous influence. There seems to be in some cases even a certain amount of paralysis of the organ induced at the time. However this may be, we certainly observe not unfrequently that serious organic mischief of the stomach is apt to follow protracted grief and anxiety of mind. In other cases, there is only an intense neuralgic suffering, well known under the term *gastrodynia*, and the symptoms of which so often simulate *schirrus* of the pylorus.† How often do we observe that the worst cases of this complaint, which may have resisted all medical treatment, vanish in a day by the intelligence of some

* [See page 50, 51.]

† One form of this most distressing malady is not unfrequent in medical and other students, who are preparing for their examinations, and who allow their minds to be over-anxious about the result. As a general remark, excessive application of the mind, especially when coupled with anxiety or grief, inevitably deranges the digestive functions.—*Rev.*

[A pupil of ours had been tormented with aggravated dyspepsy, a year before he went in for examination for a surgical degree; for this complaint he tried, to use his own words, "everything under the sun," without relief. Finally, he "passed" with great eclat. His dyspepsy was immediately cured—vanished "like the baseless fabric of a vision."]

pleasing news, or by having recourse to agreeable change of scene. If not relieved, the atony of the stomach will in almost every case, more or less speedily, be followed by the development of organic mischief somewhere. In one case, it may be the lungs that suffer, and phthisis is induced: in another, the foundation of cardiac disease is laid: in a third, the brain; and in a fourth, the liver or mesenteric glands are affected. Sometimes the patient dies from complete marasmus, and yet on dissection no morbid lesion of any organ is discoverable. Such was the case with Madame Nourrit, the widow of the celebrated singer at Paris: an inward grief followed the melancholy death of her husband, and gradually exhausted all the vital energies of the system, and she died of marasmus.

3. "The *intestines*," says M. Parise, "seem to be less affected by mental and moral influences than the stomach. May this be owing to their being farther removed from the gastric plexus?" There are, however, it must be confessed, not a few intestinal disorders which are very intimately connected with the depressing emotions of the mind. Not to dwell upon various affections of the liver, congestions of the spleen, constipation or irregular action of the bowels, we may allude more particularly to the common disease of hæmorrhoids. How very generally is this troublesome complaint associated with an irritable, unhappy, and peevish state of mind. We have often predicted the existence of hæmorrhoids in patients, whom we had never seen before, from merely observing the anxious expression of their countenance.

[A curious instance of the effect produced on the bowels by the imagination, was related to me by a gentleman, then an old bachelor, but since married. He mentioned that he had been greatly addicted to card-

playing—which was indeed a family failing—and that he had observed when he played for a large sum, his stomach and bowels—more especially the latter—became exceedingly uneasy in consequence, as he justly supposed, of the anxiety caused by the serious stake. He made a practical application of this moral influence over his bowels. Being, as it would appear, highly imaginative whenever these organs were disposed to be sluggish he conjured up the card table, the large stake—a bad hand—a sort of forlorn hope—and unlimited loo—all of which produced the desired effect. Indeed fright or terror is well known to produce a corresponding influence, which is a matter of popular knowledge.

Here we have an example of moral causes influencing the bowels in a marked manner. The converse of the proposition is equally true, for derangement of these organs in their turn influence the mind most remarkably—the feverish and fretful irritability—the flushing and headache which arise from this disturbance are most remarkable at all ages.

A gentleman at the head of a public office mentioned that the clerks were all quite delighted with him when he had taken over night a blue pill, and some of Abernethy's claret the following morning. They vowed that it was the best receipt for producing the *suaviter in modo*.

Foolscap was not yellow on such days, nor were pens “infernally bad:” in short, “the man in authority” was in great good humour with himself, all around him, and the whole world besides.]

4. Although the *heart* is not, in a physiological point of view, now regarded as the seat of the passions, as the language of poets and moralists would imply, no one can deny that it is powerfully influenced by them. Authors

have differed as to how far this influence is more or less direct and immediate on the centre of the circulation. Every one knows that any violent emotion of the mind, whether this be of an exciting, or of a depressing nature, is accompanied with a feeling of oppression and distress in the cardiac region, and with a greater or less degree of tumultuous or irregular action of the heart.

“ Although the nerves of the heart are by no means numerous or large, it is nevertheless certain that, under the influence of any strong emotion, their action is almost immediately disturbed.* It is therefore readily conceivable that a frequent repetition of such disturbance will, in course of time, be followed by the induction of a permanent disease of the organ. There are perhaps few cases of aneurism of the heart which are not attributable to moral causes; and when we use the common expression, that intense grief is a *heart-break*, the phrase is often true in a physical, as well as in a moral point of view. The celebrated chemist, Fourcroy, is a striking example of the truth of this remark. Napoleon had long promised him the situation of Rector of the University, but at length he bestowed it on Fontanes. Fourcroy was so deeply affected-

* Few writers on the physiology and pathology of the heart seem to us to pay sufficient attention to the intimate connexion of its functions with the state of the respiration; and yet every disturbance of the breathing is necessarily followed by some irregularity of the cardiac circulation. After a good deal of reflection, it appears to us, that the influence of moral impressions on the heart can scarcely be regarded as direct and immediate, at least in the majority of instances; but rather that this influence is exerted primarily on the lungs, and only consecutively, on the heart. Attend, for example, to the influence of fear: the breathing is immediately suspended, the throbbings of the heart follow. It is to Mr. *Wardrop* that the profession is especially indebted for the most lucid exposition of this and such like phenomena. Vide his ingenious work on the heart.—*Rev.*

by this conduct, that all the symptoms of a heart complaint became immediately aggravated; and while in the act of signing some public papers, he cried out *je suis mort*, and immediately expired in the arms of an attendant."

We may here observe that one of the corporeal or physical signs of prolonged distress of mind is a marked predominance of the venous over the arterial system. This is doubtless owing to a diminution of the contractility of the heart, and to the consequent stasis or languor of the general circulation. The French proverb—*qui voit ses veines, voit ses peines*—is therefore strictly true. The influence of the mental emotions on the functions of the kidney is strikingly exemplified in almost every case of hysteria. It is not indeed easy to explain why there should be such a copious limpid secretion at the decline of an hysterical paroxysm; but that such is the case, every tyro in medicine knows.*

The *mamma* is another organ, whose secretion is very decidedly affected by the state of the mind and feelings.

"The milk," says M. Parise, "becomes suddenly fluid and aqueous, or thickened and acid, or diminished in quantity, or even totally suppressed, returning perhaps as quickly again, by various mental causes, without the slightest appreciable change in the mammary glands themselves. These phenomena we observe almost daily in women who are of a highly nervous and impressionable temperament. An excessive, but ill-balanced, tenderness

* We have seen more than one case where diabetes mellitus seemed to have been brought on by protracted anxiety and distress of mind. In these cases the spinal marrow appeared to be a good deal at fault, as there was a very marked debility of the lower extremities present at the same time. The cases did well under the influence of animal diet and change of scene.—*Rev.*

on the part of a nurse often unfits her from suckling her child with advantage.* If Rousseau had been acquainted with the laws of the animal economy, he would not have insisted so urgently as he has done, that every mother, without exception, should suckle her children : his eloquent appeal has on many an occasion proved most hurtful to both."

The cutaneous functions are very notably affected by the emotions of the mind. How chilly becomes the skin, when grief is preying on the heart ; and, on the contrary, how the whole surface glows with warmth when the soul is filled with joy. Captain Ross, in the narrative of his arctic voyage, alludes particularly to the circumstance of mental depression rendering the body more susceptible to the impression of cold, and mentions that several of his men became morbidly irritable : the accounts of the disastrous retreat of the French from Moscow, and of the awful shipwreck of the *Medusa* frigate, afford still more striking instances of the same state. If our space permitted, it would be easy to extend these observations ; but, as our object at present is not to write a dissertation, but only to offer a few suggestions to our readers, it is unnecessary to say more than urgently to impress on all medical men the necessity of studying the psychological causes of disease.—*Bulletin de Therapeutique*.

Well, after so much about the *morale*, let us now turn to the *physique*. In resuming the breakfast affair, we shall next consider

Butter.—From what I have before observed, you may conclude that we are not about to recommend you this

{ * [Hence such females are justly said to give to their children
"fedded suck,"]

substance as one easy of digestion. It belongs to the class of oily aliments, which Beaumont states (p. 77) "are difficult of digestion, although they contain a large proportion of the nutrient principles." Philip says, "There are few things in common use so oppressive as butter. It appears to be more so than the fat of meat." He adds: "We have little experience of oil in this country. From the result of the few trials I have witnessed, I should say that olive oil, to a stomach accustomed to it, is less oppressive than butter, probably than most kinds of fat." Paris says, "Melted butter is perhaps the most injurious of all the inventions of cookery. Oil, when used in extremely small quantity, as a seasoning to salads, appears to prevent their running into fermentation, and consequently obviates flatulency."

It is curious to observe how liking influences so much the function of digestion, as we have before shown. We know an individual who can digest well made and good country butter, even thickly spread upon bread or toast, without the slightest uneasiness of the stomach; but heart-burn and oppression of this organ quickly follow if it be badly made, and from the city. The way in which cows are fed is well known to have a decided influence upon the flavour and qualities of their milk, and a corresponding effect upon the butter.

Honey is not so commonly used at breakfast now as formerly. Thomson states that the flavour of honey varies according to the nature of the flowers from which it is collected. Thus the honey of Minorea, Narbone, and England, are known by their flavours. It is separated from the comb by dripping, and by expression: the first method affords the purest sort: the second separates a less pure honey; and a still inferior kind is obtained by heating the

comb before it is pressed. When obtained from young hives, which have never swarmed, it is denominated virgin honey.

It is sometimes adulterated with flour, which is detected by mixing it with tepid water: the honey dissolves, whilst the flour remains nearly unaltered. The sugar of honey is of two kinds: one resembling the sugar of grapes, the other that of the sugar-cane. It is remarkable that this substance, by its union with nitric acid, is converted into an active poison—oxalic acid.

We have already alluded to its aperient properties. It was highly prized by the ancients as a medicine, for upon it Jupiter was nourished. It is apt to produce colic when freely taken, and those that have unsound teeth should avoid it, as it often causes tooth-ache. It is prone to run into the vinous or acetous fermentation, owing to the sugar it contains. When the former, and combined with water, the product is the beverage well known by the name of *mead*.

Eggs :—The greatest possible variety may be observed in reference to these. Some cannot touch an egg, while others cannot dispense with one at breakfast; but, like the country milk and butter, a great deal will depend upon the freshness of the egg, or the reverse. Those who get their favourite in the former condition will digest it with perfect ease; while if in the latter state, it will often produce an almost febrile condition.

Philip says: “Eggs, so far as relates to a tendency to produce fever, may be regarded as of a middle nature between animal and vegetable food. It is a common opinion that they disagree with bilious people; that is, people labouring under indigestion, in whom the disease has extended to the function of the liver; and in some

cases it is so. In many even in this state of the disease, they are easy of digestion. I believe the best way of eating them is soft boiled, with stale bread, the yolk and white part being mixed together. To a few stomachs the white of egg is particularly oppressive." When this is the case the yolk may be mixed with as much fine sugar as will be sufficient, beat up, and then tea poured on at nearly a boiling temperature; the yolk will be thus intimately mixed with the tea and constitutes the nutritive beverage described by Kitchiner. (P. 134.) Raw eggs are aperient, but not so easily digested as when underdone.* Cooked eggs, more especially when hard, are very slowly digested. When in this state some add vinegar and pepper, which accelerate their chymification.

It is a common thing for sportsmen and huntsmen, to put several hard eggs in their pockets when they start in the morning, which they are able to digest through the day as luncheon, without requiring the aid of either vinegar or pepper. Some take too much salt with their eggs, consequently they are unusually thirsty during the day. Those that are very fond of butter soften the hard egg, and harden the soft one with their favourite aliment.

Kitchiner says of eggs, the fresher laid the better: put them into boiling water: if you like the white just set, (which Dr. Pearson approves of,) about *two* minutes boiling is enough. A new laid egg will take a little more: if you wish the yolk to be set it will take *three*, and to boil it hard for a salad ten minutes.

Observations.—A new laid egg will require longer boiling than a stale one, by half a minute. *Tin machines for boiling eggs on the breakfast table* are sold by the iron-

* An egg is said to be *hardly* done when it is either overdone or underdone.

mongers, which perform the process very regularly : in four minutes the white is just set.

N.B.—Eggs may be preserved for twelve months in a sweet and palatable state for eating in the shell or using for sallads, by boiling them for one minute ; and when wanted for use, let them be boiled in the usual manner : the white may be a little tougher than a new laid egg, but the yolk will show no difference.—Hunter's Culina, p. 257.

They are commonly buttered, which also tends to preserve them for some time.

If you wish to determine whether an egg be *decidedly* unsound or not, immerse it in water ; if the former, it will rise to the surface.

We have shown before, that the living principle enables that which possesses it to retain a higher temperature than where it is absent : hence an unsound egg—the latter condition—will indicate by the thermometer, a lower temperature than the egg, which retains its vitality.

Fish is seldom found at breakfast in Ireland. In Scotland a great variety of such aliment is then provided. The breakfast of the hardy northman is generally much more substantial than that in this country. I understand that even whiskey—"mountain dew"—is not unfrequently quaffed either before or after this repast. We have already alluded to the influence of liking in aiding digestion ; when this condition is associated with the active and healthy habits of our northern neighbours, we can at once explain why fish, and that which is so much stronger, will not disagree. Flat fish is the most digestible, such as sole, but when dried or preserved it is less wholesome. Fish, while it is less stimulating than our ordinary flesh meat, does not afford so much nourishment as the latter. Paris states " that firmness of texture, whiteness of muscle,

and the absence of oiliness and viscosity, are the circumstances which render them acceptable to a weak stomach."

Our experience does not warrant us in recommending fish of any kind—not even whiting, called "*the chicken of the sea*"—or in any form as a substitute for meat, when the powers of the stomach are not very considerable, and this kind of food is not taken with a decided liking.

We shall have occasion to revert to this aliment when on the subject of dinner, until which time we will reserve any further observations, upon its varieties and their several properties.

Meat.—Those that sit down to breakfast with a good appetite will be often quite able for this substance; but, generally speaking, you will find that meat more than once a-day is not relished as an every-day thing at breakfast, unless the individual is very healthy, of active habits, and takes a great deal of exercise in the open air. For the man of every day working habits, and who goes to business immediately after this meal, will in general feel best with the light breakfast. This is readily explained, from what we have before stated, (p. 89,) owing to vigorous digestion requiring a state of corporeal as well as mental repose, during its continuance. We shall have occasion to show, when speaking of the valetudinarian, that meat will sometimes form the best breakfast for him when his appetite is so delicate that it becomes necessary to give him solid and nutritious food in a small compass.

If a long interval must elapse between breakfast and dinner, the former should be of a more nutritive character and substantial, for obvious reasons.

We have before alluded to the "collop" of bacon; this and ham will be often digested when mutton chop, beef, and even game, cannot. There is a great deal too in the

desire which some have for animal food, while others are quite averse to it : the former often say, they feel that with them no substitute can be made for this nutritive substance, although it were but a scrap, they must have some of their favourite aliment ; in fact they consider that it is indispensable. Again, the latter often tell us that they care little for meat, and could entirely dispense with its use. The stomach of the one and of the other is thus as different or as opposite as their respective figures and faces.

It is the knowledge of this fact that renders it so difficult to lay down rules in reference to the qualities of food. With respect to quantity, the same obstacles will not occur. It has been before suggested as the rule, that we should cease to eat before appetite was quite removed. Indeed, with reference to the quality of diet, we are taught from observation to determine that which agrees or disagrees with most people, and consequently are enabled by this knowledge to determine pretty accurately what should be the code of dietetics for all. It is obvious that general rules are not overturned by some exceptions—*exceptio probat regulam*. We may hence admit the truth of Van Swieten's observation, without prejudice to this position. He adds, " that to assert a thing to be wholesome, without a knowledge of the condition of the person for whom it is intended, is like a sailor pronouncing the wind to be fair without knowing to what port the vessel is bound."

The following observations by Philip pretty nearly agree with our ordinary experience, and with the results of Beaumont's experiments (p. 99) :

The stronger kinds of animal food, of which beef may be considered the strongest, are most apt to excite fever. On this account we often allow those recovering from

fever, or otherwise disposed to it, to eat the animal mucilages, or those meats which contain a great proportion of them, when even mutton, for example, is forbidden. Thus animal jellies and young meats have obtained the name of light; but this only relates to the tendency to produce fever; for as far as digestion is concerned, they are heavier than mutton, and, to many stomachs, than beef. A similar observation applies to the vegetable, compared with the animal, kingdom: the former are less apt to excite fever, and are therefore called lighter, but they are in general more difficult of digestion. From what it arises that mutton is to most stomachs so much more easy of digestion than beef, it would be difficult to say. Most kinds of game are of easy digestion. Fish, independently of the heavy sauce with which it is eaten, is, for the most part, less easily digested than the flesh of land animals; and as it is at the same time affords less nutriment, it is in both respects less proper for the food of dyspeptics; although from the white kinds being less apt to excite fever, they, like the animal mucilages, have obtained the name of light, a term which so often deceives with respect to what is most easy of digestion, that it is necessary to keep this explanation of it in view. The meat most mixed with fat is *cet. par.*, most oppressive. It is on this account that pork and the tongues of many animals are of difficult digestion. For the same reason, geese and ducks are the most oppressive kinds of poultry. Turkey is more so than fowl, which, next to mutton, is, perhaps, upon the whole, the most digestible animal food in common use, if the skin be avoided. Of the different kinds of game, pheasant is least easy of digestion. The lean part of venison is, perhaps, the most digestible article of diet. Hare and partridge

appear to be as much so as mutton. All kinds of meat become more digestible by being kept till they are tender.*

Every day business.—Having concluded the subject of breakfast, we should next, according to our plan, proceed to consider how the individual we selected, ought to dispose of his time between breakfast and dinner; reserving the modifications which are required according to age, sex, temperament, climate, seasons, and habits, as subjects of subsequent observations. It is plain that a difficulty arises at the very outset. The individual is, of course, to be a man of business; but of what profession—the clerical, the medical, the legal—all dignified by the title learned—or is he to belong to the military, the naval, or the mercantile professions, &c.? It is obvious that we should write volumes, were we to select a specimen of each class. We will therefore take one from our own profession—*sutor ne ultra crepidam*—as a representative for some practical hints in reference to every-day concerns. We think there are some good reasons for selecting one of the medical faculty, more especially on an occasion such as the present. Firstly, his avocations bring him very much in contact, in a familiar and confidential way, with all classes of society; so that he thus becomes a fair representative of one of the public.

Secondly; medical men have become so numerous in their generation, that we can scarcely find a family which has not some relative or connexion belonging to this department; hence they form an interesting and bulky integrant part of society at large.

* It is a common thing to observe in the stalls of a London butcher, seventy or eighty legs of mutton hung up for this purpose, and bespoken by his several customers.

Thirdly ; we conceive that the present is a fitting occasion to solicit the attention of the public to a short statement of some familiar facts, which we trust will demonstrate that the medical profession is peculiarly preeminent for its usefulness, its labours, and its philanthropy.

Lastly and mainly, we do think the public should feel the deepest interest in the every-day avocations of the medical man. His studies—his training—his character—moral and intellectual ; in short, the physiology of his pursuits, even though a mere outline, must tend to inspire confidence in the rules of prevention and of remedy laid down by him, who, by PROFESSION, has to discharge the important duty of preserving the functions of both body and mind in a state of health. The education of the practitioner—like that of the Spartans of old—becomes a sort of public question, or at least one in which the public are most deeply, nay, vitally, concerned. It therefore behoves them to look well to the moral and intellectual attributes of those men, into whose hands they commit not only their lives and their health, but who not unfrequently, from their very office, become inevitably the depositories of trusts and of secrets, involving the reputation and happiness of their patients and their friends.

The importance of this subject was admirably enforced by the President of the College of Physicians, Sir H. Marsh, on a late occasion, in the following terms :

“ No greater benefit can be conferred upon the land than to scatter over its surface a sufficient number of really well-educated medical practitioners—it is sowing a seed, from whence must be reaped an abundant harvest. The influence and the utility in society of humane and really well-educated medical men is greater than is generally known and estimated. They possess the capability not

only of restoring health and relieving pain and suffering, but their example and their conduct spread around the circle within which they move, a benign and elevating influence—an influence not confined to the wealthy and the noble, but one which extends itself to the poor man's hut, to every rank and condition of life, and fails not, when well exercised, to scatter blessings around. But, observe, I speak only of well educated medical men. There is, therefore, no subject to which the legislature should pay more attention than to that of providing for the youth destined for the medical profession, a sound and judicious system of preliminary education, moral and intellectual. For if a well educated medical man be a blessing, an ill educated, or a half educated one is a curse.”

The observations I shall make will be applicable, in many respects, to other professions and callings besides that of medicine. There are certain principles in physiology that are of general application in reference to the functions of both body and mind, for example: in every pursuit the common end in view is either the good of the public or the interest of the individual, or both combined. Experience has shown we should never view these two apart, and that the grand principle—social and self interest should be the same—ought never to be lost sight of.*

* It was justly observed by an eloquent writer, that “there are in knowledge these two excellencies: first, that it offers to every man, the most selfish and the most exalted, his peculiar inducement to good. It says to the former, ‘serve mankind, and you serve yourself;’ to the latter, ‘in choosing the best means to secure your own happiness, you will have the sublime inducement of promoting the happiness of mankind.’ The second excellence of knowledge is, that even the selfish man, when he has once begun to love virtue from little motives, loses the motives as he increases the love; and at last worships the deity, where before he only coveted the gold upon its altar. And thus I learned to love virtue solely for its own beauty.”

There are reciprocal duties between the public and the individual, which should be clearly recognised and acted upon. When these are fairly regulated, the working of the social machine goes on smoothly; each wheel is fed with oil in proportion to its work—its friction—its wear and tear—there is no jarring nor out-cry for the lubricating fluid: in other words, the duty demanded is discharged, and the requital, justly due, is given in return.

Employment — Work — Healing art.—Our profession often, very often, places us in trying and perilous positions, in a physical, moral, and intellectual point of view.

Now, we feel that the delivery of a lecture suitable for all, is both a perilous position and a trying undertaking, in relation to the foregoing threefold considerations.

Again, there is the selection of *materials*; “aye, there’s the rub;” for although we have not *here* in this theatre, the distinction of pit, boxes, and gallery, yet still we have a mixed group to cater for.

Firstly, our brother practitioners that give us the light of their countenances—these are the knowing ones of the pit; something sound and sententious should be propounded for these grave gentlemen, as well as for our amateur lay friends, who are deeply learned in literary lore.

Secondly: the every-day man—say one of the public, we have specially invited to listen to what we have to say for ourselves. To keep him awake for an hour, we must not assume a leaden nor learned aspect, nor give a history of medicine fairly copied from the last edition of the Medical Almanack. We fancy that the sterterous breathing of a gentleman so addressed would be apt to fright our auditory from their “propriety.”

Well, the last, not the least—and indeed the most

interesting portion of the group before us—are the dashing fellows of the boxes—the dress circle—the senior and the junior students*—these are the “*real sort*”—the delight of our eyes—the lads that make our tongues wag.

Now, instead of giving twenty minutes of the heavy, twenty minutes of the dull, twenty minutes of the light, and, if you will, the sentimental; let us endeavour to follow the rule of Horace, and combine the grave and the gay—the *utile* and the *dulce*—so that the whole mass shall be fairly leavened, and thus rendered light and easy of digestion, as a species of intellectual refreshment for ALL.

When brief space only is afforded for the consideration of extended and varied subjects, two modes of proceeding naturally suggest themselves. Firstly, to select the most important and prominent parts, and consider them in detail; or secondly, to take a wide range, and describe or touch cursorily upon a greater number of subjects. The latter plan is perhaps the more suitable for *this* lecture: the former mode the more eligible for a monograph.

In truth it is the fashion—surely you will not require me to be out of it—to treat on occasions such as the present, “concerning everything under the sun.” Well, although the sketch must, consequently, be a hasty one, the student, I trust, will gather from it the conviction, that an orderly and well arranged course of study is indispensable, for the attainment of sound professional knowledge, the grand object of all his labours.

It naturally occurs to every reflecting mind, before undertaking any pursuit, still more when that pursuit is a profession, to enquire strictly, what, in the first place, is

* This class naturally look for the selection of our man of business from the medical profession, and that we should say something about “Shakespeare, taste and the musical glasses.”

the nature and true value of the object sought ; and, secondly, whether consonant with our tastes, habits, and pursuits, or otherwise.

The choice of a profession is almost as important as that of a wife ; you take it for better for worse, for rich or for poor, in days of sickness, or in days of health.

You should ask yourself do I go to it *con amore*, this is most essential in the medical profession ; you should well weigh the labours, the difficulties, the weighty responsibilities of the “ Healing Art.” It is not to be chosen because a father, or an uncle, or a friend is at the profession, and will afford facilities by his position and patronage to the acquisition of, and advancement in, the contemplated calling.

Remember that the elevation caused by your boot-maker may escape observation, but that effected by *stilts* is too obvious, both as regards the position and the means of attaining it, to be regarded in any other point of view, than as rendering the height ridiculous, unsafe, uncertain, and therefore unenviable.

In our profession *you* must be the architect of your *own* reputation. What has been called a lucky tide of events has suddenly, but *undeservedly*, raised individuals in every profession ;—such elevation will not be permanent.

Having clearly ascertained what the calling is, and our disposition towards it—liking—disliking—or being indifferent to its duties ; we should, in the next place—having determined in the affirmative—inquire are the means of attaining this object within our reach ? that is, supposing the profession suitable, do we possess the moral, intellectual, physical, and pecuniary requisites necessary for its acquisition and its practice. These are preliminary inquiries of paramount, of indispensable importance. Is it not, my young

friends, absolutely necessary; does not common sense or common prudence demand, that you should ascertain to the best of your ability, firstly, is the profession of medicine suitable for you? and secondly, are you, or will you be, fit and eligible for the discharge of its important and responsible duties?

Deeply impressed with the vital importance of these inquiries, more especially for those about to commence the profession, I esteem it one of the bounden duties of my present position, as an introductory lecturer, to afford such data as time and my experience will permit, in order to assist you in forming conclusions involving most seriously your future prospects, your happiness, or your misery. I seek not to decoy or deceive you—I wish not to scare or affright you, but I owe it to my valuable and valued friends—the medical pupils of these countries—to give them the result of my experience, in reference to a subject of such importance and so momentous, in relation to their future welfare, and that of the public at large.

Truth, naked and unadorned, shall be my guide—should I stray from her path, and lose sight of her pure and spotless form, I trust you will consider the lapse as involuntary, and also remember that I possess but the erring vision of man, rendered still more imperfect by the misty media, which are so constantly interposed between him and such an unearthly object.

The race of intellect of the present day has rendered our very youths philosophers; I therefore may assume that in this, the nineteenth century, it would be superfluous to dwell at any length upon the usefulness of the *Healing Art*; that which restores health to the diseased—comfort to the afflicted—removes the cup of bitterness from pining affluence—gives the wealthy the power of enjoying and relish-

ing those blessings, which without health are but tantalising mockeries. This is not all—owing to the reciprocal influence of matter on mind, the diseased condition of the body produces a moral effect which renders the unhappy individual morose, irritable, and desponding.

The preservation of health ; the removal of disease ; the prolongation of life, are objects of such paramount, of such absorbing importance, that these, the mere abstract definition of the Healing Art, need but enunciation to gain our hearty assent to the magnitude of its usefulness.

That it bears the stamp of imperfection we do admit, but this defect belongs to all things human, in common with medicine. It is ungenerous, as some have attempted to affect, to decry and depreciate the value of this science, because its useful labours are not *always* crowned with success ; and to attribute to coincidence what has been the result (under Providence) of medical means, judiciously employed.

The study and practice of medicine have for their end the pursuit of happiness, for we have just shown that the object of the healing art is to preserve health, remove disease, and prolong life ; it is therefore plain that to render existence a state of enjoyment, there must be an exemption from disease.*

All the knowledge and experience we can accumulate upon this or any other subject, must owe their origin either to sensation or reflection : the one, employed about impressions from without ; the other engaged upon ideas from with-

* " O blessed health ! thou art above all gold and treasure ; 'tis thou who enlargest the soul, and openest all its powers to receive instruction and to relish virtue ! He that has thee has little more to wish for ! and he that is so wretched as to want thee, wants every thing with thee."

in. The accuracy and extent of our knowledge in any case, depend upon the correctness and powers of our sensitive and mental faculties : the former furnish the mind with the crude material, and by the operations of the latter, they are so combined, compared and abstracted, that their original source might be almost overlooked ; yet still when we commence existence, the mind is, as Locke expresses it, but “ a sheet of white paper ;” and may we not figuratively make the senses, the carriers of the pictures and images into the presence chamber of the mind ; to be recognised by perception ; to be compared and abstracted by reflection ; and lastly, stored and arranged by memory.

Thus, in order to form just and correct conclusions, all the operations both of sensation and reflection must be faithfully and accurately performed.

But with all our care and all our labour, we must confess that the stamp of imperfection is deeply set on the practice of the healing art ; for, therapeutics (remedies) have never been established upon fixed principles or indisputable data, consequently, the treatment of the practitioner is generally uncertain, frequently, if not actually injurious, or quite useless, for the *vis medicatrix naturæ* or the restorative powers of nature, often produce a favourable termination without the interference of art. Notwithstanding, medicine approaches as near to perfection and certainty as the other sciences, but is rather inferior to them in certainty, principally because the observer is liable to be deceived more readily in the object of his observation ; hence successful treatment depends more upon the *sagacity* and *judgment* of the practitioner than upon any fixed rule.

I seek not to prepossess your minds, or prejudice the claims of the healing art, of which I wish you to entertain but adequate notions : to steer clear of the extremes of

scepticism on the one hand, and of credulity on the other.

In short, the good physician should be an acute, an accurate observer, and a sagacious reasoner—such a one esteems medicine as a practical pursuit, and consequently exercises his profession with credit to himself, and advantage to his patients.

It is, in my mind, a great error to suppose, that it requires a man to be a genius, in order to make a good physician or surgeon. By no means! As respects the intellectual requisites, I would say—as medicine is a science of induction—that all the qualities which are essential may be summed up in the following: 1st, a turn for close observation; 2ndly, the exercise of sober judgment or common sense; and 3rdly, a decision of practice growing out of the preceding two.

Disease, is a very proteus in its nature; it requires to be watched with lynx eye; general rules and principles may be laid down in books and lectures; and no doubt they are useful—nay, often, indispensable—but come to practice; and attempt to apply the rigid rule to half a dozen cases of the same disease, even in the same stage, and you will find that it proves injurious—nay, it may be fatal to some. There is a knowledge, as extended as the varied phases of disease, which words cannot convey, or at best, but very imperfectly.

It is a store, that we must gather ourselves, at the *bed-side* of the sick—not simply the result of extensive practice. No! but the result of observing things seen—of perceiving things felt; in short, of sagaciously discriminating; and, therefore, taking into account what circumstances are essential, what are accidental, in the diagnosis, the treatment, and the progress of disease.

Without a devoted attachment to authority of any kind in medicine, beware how you repudiate the old doctrines, and adopt many of the new. Remember that the several systems have successively risen on the ruins of each other, and that the infallible doctrine of one age becomes an object of ridicule in the next. In this patent age of steam and new inventions—of animal magnetism, homœopathy, and psycho—physiology—the novelties in medicine, may, from the rapid march of intellect—the railroad pace of discovery at which we have arrived—be supplanted by two or three successions of such phenomena, even in our own times.

Believe me, gentlemen, the science of medicine owes most to your men of patient observation, of sound sober judgment; who are largely gifted with that uncommon attribute, common sense—not a genius for, *ingenium et judicium raro coeunt*: a man such as Harvey, the cautious and pains-taking discoverer of the circulation, an indefatigable and successful searcher after truth, amongst the rubbish and ruins of erring ages.

Samuel Johnson, the sturdy moralist, in casting about for a subject, adopted one, because, as he stated, his writings upon that one would not be of ephemeral value. Human nature was the subject, which is immutable, the same to-day, yesterday, and for ever; for man, in his moral nature, is still unaltered in every age—in every clime. But these sketches of character would not still be prized if Johnson had not held up the mirror to nature, and given the image in her true colours.

A precedent so good with reference to our moral nature, holds equally good in relation to our corporeal being; but the descriptions of disease, by the physician, to be equally prized with the sketches of character drawn by the moralist, must be equally graphic—equally true; in short, in conformity with the reality of things.

LECTURE VIII.

GREAT demands are, indeed, made upon the student as well as the practitioner of medicine, in a physieal, intellectual, and moral point of view. Of the last we have already spoken at p. 171.

We shall, with your permission, consider the other two on the present occasion. Let us first look to the senses.

The objects of *sight* should receive the closest attention; what an infinite source of information the eye proves to be: witness, for instance, the diseases of infants, where we are shut out from all description on the part of the patient. Many diseases have such peculiar features, that a single glance enables the skilful practitioner to detect the malady: the peritonitic position, the risus sardonius of locked jaw, and the facies Hippocratica of death, once observed can never be forgotten.

It is surprising how much we can educate our senses, more especially that of *touch*. Look at the remarkable acuteness of the blind in this respect. The erudite sense of the practitioner, evinced in hernia, and in discovering deep seated matter. In practice you must be, in many instances, a St. Thomas, and be determined exclusively, by the evidence of this unparalleled sense.

The advantages which modern pathology has acquired from the practice of auscultation—the certainty with reference to physical signs, derived from the stethescope, places the sense of *hearing* with reference to professional objects, in a paramount point of view.

But the sense, we regret to say, which is most perverted, even by medical men, is that of *smelling*. Now,

we do say, with great *disrespect* for snuffing and smoking, that these practices are both an abomination. I recollect observing in the bed of an old gentleman, two snuff-boxes: I said he was doubly armed; whereupon, he laconically replied, with a smile, "I regret that I have not been blessed with two noses, in order that I might double the pleasure of *snuff*-taking."

We may add, that I lately cured a resolute friend of mine of aggravated dyspepsia and tormenting head-ache, by inducing him to give up snuff.

A gentleman called upon the late Dr. Cheyne, and requested his advice for constant morning sickness. While describing his symptoms, the doctor observed that the patient had scarcely returned a snuff-box into his pocket, when it was again, as it were mechanically, withdrawn, and his capacious nose as often most copiously and eagerly supplied, as if the nasal organ were in a state of starvation! Well, the sagacious doctor asked permission to inspect the contents of the weighty box, and to the no small surprise and consternation of his patient, emptied its contents into the fire; and next coolly observed that when he returned and assured him that he had been cured of snuff-taking, and, of consequence, of morning sickness, the patient should have his box, and he would then take his guinea.

I recollect that a practitioner had been called to a case of suspected small-pox; and that he declared it was not *the* disease before he had looked at the patient; as he did not recognise the peculiar odour which is given out by the *true* malady. Several medicines have most characteristic odours, more especially the narcotic tribe, and those that are named nervous.

This sense will often lead you to conclude that animal food

or wine has been recently given to your patient contrary to directions ; which will account for an unexpected quickness of pulse, and flushed countenance, without the attendants being put to the pain of confessing their delinquency.

You will be often requested by patients, more especially by hypochondriacs, to *taste* the medicines you direct ; indeed much has been done in modern times to spare the infliction of this sense, by using the suitable corrigent of unpalatable medicines.

Under the head of physical considerations, we should state that a good constitution is indispensable, to enable you to encounter and sustain the arduous and unceasing duties of a laborious profession, the harassing calls of which cannot be postponed. Recollect that “method is the very hinge of business,” and that order was “heaven’s first law ;” therefore, “all things should be done decently and in order.” Never procrastinate, and you will find time for everything ; parcel out your studies and duties with care, and you will not be embarrassed and oppressed. Too much labour to be accomplished in a short period, necessarily hurries and distresses you—the machine is overworked—deranged health, or, perhaps, fever, is the result.

In order to render you hardy, you should accustom yourselves to bear the sudden vicissitudes of our climate, which are almost constant in this country of changes, changeful indeed both in a physical and moral point of view.

The late and lamented Sir A. Cooper had his person sponged daily with vinegar and water, which he mentioned in his lectures had given him a perfect assurance against taking cold.

The relaxation during the autumnal recess*—the invigorating and healthful influence of field sports, and the endless enjoyments of home, not only brace the body, but also strengthen the mind for the winter's campaign.

When we see our friends—indeed we are glad to see them—returning to town after the recruiting influence of pure air, our pallid pupils now restored to ruddy health: the contrast is most striking—and no wonder, we—doomed to be citizens all our lives—should be irresistibly led to exclaim with Horace, *O! rus quando te aspiciam*.

Now let us turn to the *intellectual* qualifications necessary. Here great difference exists between man and man. We may say, generally, that the impressions made upon our senses by outward objects, are pretty uniformly the same in all; but, it is in the waving of the intellectual web out of the raw materials furnished by perception, that the value or superiority of the divine artificer, Reflection, pre-eminently appears.

Still, do not, my young friends, conceive, that it requires a lofty genius to make a good practitioner, or an eminently successful man of business. By no means! It is as lamentable as it is true, that those gifted with a superiority of natural talents are frequently deficient in industry and application. The consciousness of ability engenders a species of pride, (let us say conceit,) which ill befits them to exercise a sufficient cultivation of their minds; while the less gifted—nay, the almost talentless—by persevering industry, work out the rich rewards of their patient, continued, and meritorious exertions.

* The last regulations of the London College of Surgeons require four years study at a recognised hospital—only three months are allowed for a vacation in each year.

Remember that your mind must be ever active in the acquisition of knowledge. Locke has judiciously said, "we may see a landscape or a clock daily, and still know little or nothing of its individual parts, until we come to *examine* it attentively."* In order to acquire a just knowledge of any subject, you must consider it on all sides ; over and over again. In fact, repetition and attention, are not only the best means of obtaining exact knowledge, but, such ideas, like riches accumulated by labour and industry, are tenaciously retained, because they have been acquired by exertion and with difficulty.

You will find one of the best means of remembering ideas connected with any subject, is, to understand fully the matter at the outset. The characters then marked are deeply impressed on the memory, for the stamp is set firmly and accurately at the time of their formation.

Associate as much as possible the subject matter of your studies ; this is more especially useful in reference to anatomy and physiology ; the joint consideration of the organs and their functions reciprocally lead to the knowledge and recollection of each. It is indeed a common thing to speak of burthening and crowding the memory. If ideas like matter, possessed *impenetrability*, we might seriously entertain *this* subject ; and since the

* My friend, Surgeon Lover, when he kindly lent me some of these plates, said, on looking to *this one*, that he did not accurately understand the anatomy of the muscles of the pharynx, until he made *the* drawing ;—"and why?" you may ask. I would answer, "Because repetition and attention were required in order to enable him to delineate *faithfully*." I cannot resist the present opportunity of mentioning that Mr. Lover's plan of popular lectures on physiology and natural philosophy, were at *first* considered visionary ; but I am happy in stating, that this gentleman is *now* considered to have supplied a public want by his clear, able, and scientific lectures.

storehouse could contain only a certain number of ideas, we should select the good, and reject the bad and indifferent. But memory is only a faculty of the immaterial soul, by which it retains the ideas formed of things, and recalls them to the mind's eye, when required for reconsideration. It is the Atlas of the intellectual world—the more you load it the firmer it stands: like our muscular powers, it becomes invigorated and improved by use and exercise, while disuse and inaction render it puny and degenerated.

Cultivate then, my young friends, this faculty, so essentially necessary; without which your minds are but cribriform tissues—bottomless tubs. We are told that pleasure and pain tend to fix ideas in the memory. Well! this is another reason why you should undertake your professional pursuits *con amore*. I would desire that your studies should be considered your pleasures:

Labor voluptasque, dissimillima natura Societate quadam
Inter se naturali sunt juncta.

We have hitherto aimed at giving you habits of order and regularity; as also, a taste for professional and literary pleasures.

Remember that idleness is the trap set for virtue. The reading man has a monitor in his bosom, that constantly reminds him how much his happiness is independent of outward circumstances. He is irresistibly led to *mental* employment—his habits become formed—they are those of industry, of usefulness, and of virtue.

Now, if you regard your present happiness and your eternal welfare, be circumspect—be cautious in the selection of your companions—in the formation of your friendships. Be not caught by a pleasing exterior and fascinating manners. “*Fronti nulla fides tu ne crede colori.*” Seek

those that have evinced a determination to eschew idle pleasures, and devote themselves to their studies; but, above all things, fly from the intemperate and vicious. (See p. 107.)

Trust not to plausible professions. "The tree is known by its fruit."

"A wit's a feather, and a chief's a rod,
An honest man's the noblest work of God."

Remember that you are no longer school-boys; you should lay aside puerile pursuits—some of you will soon be practitioners. You should cultivate such habits amongst your fellow-pupils as will best fit you for the great world with which you will soon have to deal. Recollect that to be good—to be virtuous—you must "take up your cross daily." In the little world, which this school presents, you will find the necessity which exists, of studying patience and self-control.

Always look to the motives or intentions of the individual before you think of taking offence at his conduct.

There is a sad lack of mutual consideration for each other in the world at large. Society requires that we should "give and take."

"Those who please to live
Must live to please."

Pupils who enter at this school are bound to submit in all respects to the guidance and decision of their teachers.

It is almost needless to add, that the industrious and inoffensive will be encouraged and supported; the idle and the vicious—should such be found—shall be discountenanced and punished.

Dr. Paley, the celebrated author of *Natural Theology*, and who had a great taste for anatomy and physiology, said, that he never allowed his wife and daughters to go in debt

for anything ; and he adds : “ ready money dealings are a great and salutary check on the imagination.”

Your parents and guardians have bestowed upon you the cap of liberty. I trust you will prove yourselves deserving, by wearing it becomingly. How painful and humiliating should be the reflection of abusing *their* confidence.

Fly the temptation of idle pleasures and expenses ;—do not call prodigality generosity, or substitute either for justice.

Remember that when you enter upon practice, you approach a profession easy, in a pecuniary point of view, of access, and therefore considerably thronged. But indeed, a peace of twenty-seven years’ standing, has necessarily thrown a greater number into each of the civil professions ; and consequently—*ceteris paribus*—the cheapest will be always the most crowded.

It is commonly offered as an objection to entering upon a profession, that it is so “ overstocked ;” but, I am strictly of Swift’s opinion, who said, “ there’s always room in a crowd ;” the witty Dean, on being asked where, replied, “ above their heads, or between their legs.” We, of course, tell you to aspire to the former position. Providence has kindly made the world wide enough for us all, but he requires us to assist ourselves. Rest assuredly that success awaits those, who by well directed efforts, patience, perseverance, and prudence, labour to deserve it.

There is no profession under the sun which presents so fair an open, so broad a way to eminence and distinction ; it needs not the foreign aid of connexion and interest ; in fact, those collateral circumstances are of little moment ; for, when a patient or his friend considers that health and life are at stake, he will not be disposed to look for the practitioner whose greatest merit may be his family and

connexions ; but he will select the man who has been the architect of his own reputation, and whose fair fame has been erected on the broad basis of public estimation and approval.

You may naturally ask, where shall I find this broad and open road to professional reputation? We may briefly answer, in practice amongst the *poor*. Here the door lies constantly open for your admission ; you are always a welcome visitor ; here is an opportunity afforded not only for the display of your professional skill, but also for the exercise of those important relative offices which are the bounden duty of the christian, the neighbour, and the man. Here are associated the most powerful incentives to action, the discharge of a religious and moral obligation—the judicious pursuit of your own interest, and the benevolent exercise of those talents which have been bestowed for the benefit of suffering *humanity*. Look to those who have held, and now hold the highest stations in the church, the senate, the bar, and our own profession. Are they not those who by talent, industry, and sagacity, have overcome a host of adverse circumstances, and ultimately triumphed, gloriously triumphed, by obtaining the highest honours—the more gratifying, as they are the well-earned rewards of talent and personal exertion ?* “ Should we the less admire a noble river because we can step across it at its source ?”

Do not, I entreat of you, be disheartened, should your prospects appear dark, dreary, and discouraging :

Tu ne eede malis sed contra audentior ito
Quam te Fortuna sinat.

Take the foregoing as your motto. Let hope cheer

* Lord Erskine being asked what enabled a man to succeed at the bar, replied, “ Parts and poverty.”

you—let judgment guide you—let industry be yours, and you will soon find that the sunshine of prosperity will brightly gladden your path.

Avoid making enemies, but do not compromise your feelings and sentiments. Succumb to none—uphold the independence of your nature like men. Be as wily as the serpent, but as harmless as the dove. Be not overawed by the authority of the great man; he is not infallible; take not his *ipse dixit*—it is the age for investigation :

“Nullius addictus in verba jurare magistri.”

Well, in that very clever and amusing popular work, “Nickleby,” you will find the following truism, which is applicable as a sort of text for our subsequent observations : the author says, (p. 292,) speaking of success, “ ‘ So these are some of the stories they invent about us, and bandy from mouth to mouth,’ thought Nicholas. If a man would commit an expiable offence against any society, large or small, let him be successful. They will forgive him any crime but that.”

It has been truly said, that in the most elevated position there is the least liberty, because that very elevation invites observation and excites *envy*. That merit and that ability which would have carried a man successfully through the crowd, will be found insufficient for him, who is the object of general scrutiny.

“Quippe secundae res sapientium animos fatigant :”

This has been truly said by that pithy writer, Sallust. You should therefore recollect, gentlemen, that even the position won by merit and ability, may be lost by a want of that continued energy and persevering struggle which overcame all the obstacles opposed to your pioneering assent. The champion in our profession, like in that of

Christianity, must be ever under arms, must be ever progressing. A fall from an eminence is always perilous—in the medical sphere, *fatal* to *fame*. The world, in respect to our calling, may be esteemed as a school; the boy who has obtained head place, must labour assiduously to *retain* that position against his less fortunate competitors. Remember that sympathy is enlisted for the swimmer to the shore, against the buffeting billows, rather than for the individual who had encountered the same obstacles, the same dangers, and the same difficulties, but, who has now, apparently, surmounted and escaped all.

Our clever, talented countryman, Dr. Johnson, editor of the London Medico-chirurgical Review, says, in the number for July, 39 :

“Edinburgh has been long as famous for medical quarrels as for science.

Whether it be the natural sharpness of the air, or the diet, or the circumstance of so many doctors being pent in so small a space, certain it is, they are wonderfully given to fight.

Pugnacity is almost as striking a characteristic of the surgeons as of the terriers of the town.

During Dr. Cheyne's residence in Scotland, one of these numerous rows occurred.

Dr. Gregory was the occasion of it, and the rancour evinced towards him made such an impression on Cheyne, that he wisely resolved to avoid professional disputes; and to suffer injury rather than attempt to right himself, unless his moral character was likely to be endangered by forbearance. This is an excellent rule, that will be praised by many, and acted upon by few.”

Indeed, gentlemen, it is as lamentable as it is true, that “envy, hatred, malice, and all uncharitableness,” which

exist to a deplorable extent in the world at large, appear to have taken up their abode amongst *many—very many*—of the members of the medical profession—a profession in which we should naturally expect to find quite the reverse.

Strange, you will say, that men who have obtained a liberal education—remarkable alike for talents and attainments—should take such narrow, unchristian, and uncharitable views. If this had arisen, solely, from the arbitrary and unfounded distinction between physician and surgeon, that very distinction, although nominal, would still afford some grounds for difference and dispute. But far otherwise—the members of the same body—the several bodies themselves taken collectively, are influenced by jealousies, motives, and objects unworthy of a liberal profession, and calculated to depreciate and degrade the whole in public estimation.

It would seem that selfishness—the Mammon of this world—and envy, are the roots of the evil: for so long as the practitioner or lecturer remains undistinguished and unpatronised, just so long, he is esteemed no stumbling-block; and, consequently, he meets with the good-natured sympathy, bestowed upon an unoffending, “harmless poor fellow.”

Should the public or the pupils change their sentiments in reference to the same individual, suddenly a corresponding change takes place in the medical horizon, and the “poor unoffending, harmless fellow,” becomes, in professional estimation, an inexcusable intruder.

We shall beg leave to relate an anecdote, as strongly illustrative of this position:

A friend asked the late Surgeon R——, of this city, how he was progressing, almost at the outset of his professional career. “Very well,” was the reply, “I am

now making 500*l.* a-year." "You are jesting," said the inquirer, "it cannot be possible!" Some time elapsed, when Mr. R. called upon this friend, and stated that Surgeon —, the man whom he had esteemed as his well wisher, had spoken ill of him. The sagacious listener replied, "Go home, R., rejoicing; you are a lucky fellow. I believe *now* that you are making the 500*l.* a-year."

Gentlemen, so it was in the days of R., so it has proved to be, in the history of medicine, in every age :

"Envy doth merit like its shade pursue,
And like the shadow, proves the substance true."

True it is, that *some* noble spirits have at all times soared high, and, owing to that lofty position, have obtained the enjoyment of a clear atmosphere, from which they can look down with improved vision, and mourning pity, upon the lower regions of the mean and grovelling; deceived, and distracted by the mists and meteors, which are the constant offspring of the insalubrious soil *they* inhabit.

I regret to state, that I have not coloured the picture too highly; I have drawn a sketch of my profession but too true; one that I deeply regret to say, has been the result of long and painful observation.

I beg you will permit me to read for *you*, my *young* friends, the fable of the Viper and the File :

A viper entering a smith's shop, looked up and down for something to eat, and seeing a file, fell to gnawing it as greedily as could be. The file told him very gruffly, that he had best be quiet, and let him alone; for he would get very little by nibbling at one who, upon occasion, could bite iron and steel.

Application.— By this fable we are cautioned to consider what any person is, before we make an attack upon him

after any manner whatsoever ; particularly how we let our tongues slip in censuring the actions of those who are, in the opinion of the world, not only of an unquestioned reputation, so that nobody will believe what we insinuate against them ; but, of such an influence, upon account of their own veracity, that the least word from them would ruin our credit to all intents and purposes. If wit be the case, and we have a satirical vein, which at certain periods must have a flow, let us be cautious at whom we level it ; for if the person's understanding be of better proof than our own, all our ingenious sallies, like liquor squirted against the wind, will recoil back upon our own faces and make us the ridicule of every spectator. This fable, besides, is not an improper emblem of envy, which, rather than not bite at all, will fall foul where it can hurt nothing but itself.

Gentlemen, I will be told that it is useless to contend against what has existed from the days of Æsop to the present time ; but, I would reply, that although we cannot remove nor neutralise the evil of our common nature, yet, still, it may be modified and controlled.*

* His Grace the Archbishop of Dublin, in an address on the intellectual and moral influences of the professions, delivered at the opening *soiree* of the society of the Dublin Law Institute, adopted the plan of confining himself exclusively "to the *disadvantages* and dangers pertaining to each profession, without touching on the intellectual and moral *benefits* that may result from it." His Grace adds : " But with a view to practical utility, the consideration of dangers to be guarded against is incomparably the most important ; because to men in each respective profession, the *beneficial* results will usually take place even without their thinking about them ; whereas the dangers require to be carefully noted, and habitually contemplated, in order that they may be effectually guarded against." Speaking of clannish attachment of an individual to the members of his particular profession, as a *body*, he adds : " Which attachment is often limited to the collective *class*, and not accompanied with kindly feelings towards the individual members of it."

Look at the legal profession—I mean judges and barristers—do you not find them exercising in the ordinary relations of life, and in their professional pursuits, a unity, a harmony, a fraternal feeling, an *esprit du corps*, alike honourable and respectable. Why should we not endeavour to emulate so good an example, and imitate a practice that would tend to raise ourselves and our profession in public estimation—a profession, the value and nature of which has been, I trust, already shown, to be of paramount, of vital importance in relation to public welfare.

I would beg to say here, lest I should be misunderstood, that of course, influenced by such sentiments, I mean nothing disrespectful nor offensive to any individual member of the profession. There are many, *very* many practitioners for whom I entertain the highest respect and regard.

If I have pronounced a philippic upon the followers of the healing art, I have done so against a *whole* taken *collectively*; in expressing my sentiments upon this occasion, I feel that I have been discharging a painful, an irksome, a humiliating task; but still one that I conscientiously believe to be a *duty*.^{*} In the discharge of this duty, I trust I have been actuated by that spirit of sincerity, modera-

^{*} See the opinion, on this subject, of His Grace the Archbishop of Dublin, foot-note, p. 224. While correcting this sheet for the press, I have received a letter from an M.D., to ascertain whether a successful brother practitioner—his *neighbour*—has a diploma from the Anglesey Lying-in Hospital or not, although the *successful* practitioner is stated to have exhibited the diploma on *two* occasions. It is remarked that this accoucheur's name is not in the list of the *quondam* pupils of the Anglesey Hospital. (Which is annually published in the almanacs and directories.) The *christian* name of this practitioner was not correct, owing to a *typographical* error. The *SUSPECTED* practitioner is a gentleman of the first respectability, and a licentiate of the Royal College of Surgeons in Ireland. I greatly fear that some of us require not only the caustic, but the actual cautery!

tion, and independence which it has been amongst my first wishes uniformly to evince.

Having pointed out so much of evil, I will briefly mention the remedy I would propose in reference to teaching and practice.

Students naturally preferred, and will prefer, graduating at that university* which throws overboard the odious distinction between university and other lecturers; and by which they save so much time, and avoid so much expense, for they do not require two sets of certificates on the same subjects. We would then say, take liberality as your guide in your studies, in your intercourse with mankind, in short, in everything in life, lay as well as professional, and if you should be in doubt, err on the side of liberality, rather than on the opposite.

The foregoing we think is equally applicable to institutions and to individuals.

My notions upon this subject and these matters will, I know, be esteemed by some as savouring too much of a latitudinarian and levelling character.

We would educate physician and surgeon alike, and in a *complete* manner, for they have confessedly the same object: cause the examinations at universities and colleges of surgeons to be alike, and the qualifications or required course of preparatory education to be the same, no *just* grounds of invidious distinction could be then complained of. Let each practitioner follow medicine or surgery exclusively, or both together, or as a general practitioner, whenever he chooses.† Let any that pleases, lecture in

* The universities of Glasgow and London are examples of this rule.

† “ In the working of the social machine, England had manifested that the mass of the public should have a general medical practitioner ;

each department of medicine or surgery. This would give a "clear stage, fair play, and no favour;" *all* would be educated alike, *all* examined alike, and *all* qualified to practice and teach alike.

Rest assuredly, neither the public nor the pupils would be slow in discovering, as in other pursuits, who were the best practitioners, who the best lecturers.

A grudge and jealousy must always exist, no matter what profession or what department of life you select, if one party enjoys rights and privileges which the other is excluded from, although equally deserving.

If you look at human nature from the cradle to the grave, you must be struck with the truth of this position.

Prudence should therefore as much as possible be mingled with wisdom in wholesome legislation—prevention is better than remedy.

This principle of assimilation and equalization would cut the ground from under the feet of envy, jealousy, and sel-

they did not recognise the arbitrary distinctions of the profession. If, in wealthy London, the 'magazine of the world,' it were found advisable, that the medical attendant of the public at large, should act in the four-fold capacity of physician, surgeon, accoucheur, and dispenser of medicines, it ought to have proved more than equally so in this country, owing to the less prosperous state of society.

And now I am anxious to guard myself against the supposition, that I blame in the apothecaries, the laudable ambition of serving the public, in the character of general practitioners. On the contrary, I highly commend the efforts they have made to render themselves, so far as they are able, capable of filling the office to which the circumstances of the times had in some degree called them. But, I do blame them for this: *that while they were eager to invade the lawful domain of the physician and the surgeon, they could not, for one moment, endure the thought that the physician and the surgeon should exercise a reciprocal liberty, and enter upon their less fenced and humbler walk.*"—(G. T. Hayden's *lecture on the Medical Profession as it was,—is,—and ought to be.* Fannin and Co., Dublin: 1841.)

fishness. It would go to effect, as regards education and practice in our moral nature, what Jenner by vaccination has already effected in our physical nature. It would tend to remove or neutralize the deforming evil, and although it might not prove an unexceptionable preventive, yet like the means used by that great benefactor of mankind, it would exercise an antidotal influence, which would favourably modify, although it had not neutralized the hateful virus.*

This, gentlemen, is, rest assuredly, no Utopian scheme ; it is exceedingly practicable ; it is based upon the physiology of man, nay, rather upon his moral pathology, learned by observation in the school of experience.

Secondly ; the *labours* of the profession are intense ; in fact, never ending.

The result of statistical tables of the length of life of the members of each profession, indicates, that medical pursuits and practice, tend to shorten the natural period of existence more than the duties of any other professional calling. How can it be otherwise ?

Look at the labours—the studies—the incessant application—the fatiguing, the harassing watchings—the exposure to night air, and to contagious diseases, when roused at midnight from a bed of weariness to visit a bed of fever ; all these fully prove, that the pursuit—the acquisition—the practice of the medical profession are arduous in the extreme.

I have as yet, disclosed but a portion of the dark side of the picture. The *student* has still to be viewed in the

* Vaccination has not invariably succeeded in preventing the occurrence of small-pox, but the latter, in such rare instances, is deprived of its malignity and subsequent deformity.

dissecting-room, surrounded by objects loathsome in the extreme—to be followed to the hospital, where he has to witness the heart-rending scenes of suffering, to which human nature is heir, both there, and in the every-day walk of life. I have next to point to him in the study, after the labours and trials of the day, wasting his health over the midnight lamp; or undertaking his studies long before the sun has risen to dispel the darkness and gloom of the night; lastly, we see him, pale, wan, and anxious, presenting himself as a candidate for degree or diploma, which is to indicate to the public his efficiency to practice and teach his profession. The result of a close, scrutinising, and searching examination, proves that the student may undertake the arduous duties of the practitioner or lecturer, with safety and advantage to the public.

Hitherto, his way has been rough and rugged; he has eaten his bread in the sweat of his brain, as well as the sweat of his brow, notwithstanding the struggle has been a triumphant one, for it has been crowned with success.*

It is true, he has been licensed to practice; he is naturally eager to exercise the functions of a practitioner; ready for the full fruition of the rewards of his labours, his long-continued and patient endurance, of hardships and privations.

Space will not permit me to do more at present, than to point to some of the obstacles and difficulties that beset his path as a practitioner.

The overstocked profession, the avenues to public patronage, favour and support, filled and choked up with anxious expectants; every standing place pre-occupied and

* I regret to say that *all* medical students do not realize this picture, which is a sketch of the *industrious* pupil.

firmly and jealously maintained; these, indeed, are difficulties and obstacles, in our present times, to be encountered in every calling, in common with medicine.

Thirdly; the *philanthropy* of the profession;—in this respect, the members of the healing art are truly pre-eminent both collectively and individually, publicly and privately. I have shown that the medical man acquires the knowledge of his profession at the cost of considerable expenditure of time and labour, under the most trying circumstances, in reference to health and feelings. His preparatory education—his energies in youth and manhood—his pecuniary resources are ALL devoted to the acquisition of a profession, by which he should naturally and reasonably hope to earn a livelihood, nay, to realize an independence both for himself and for his family. His time and professional knowledge are his estate—his stock in trade: in despite of this obvious truth, how often, too often, is he called upon to give both without the smallest recompense, to the parsimonious, improvident, and ungrateful.

It has been justly observed, that “time is money;” for surely if properly disposed of, it should bring in this necessary fruit. I would not be understood as inculcating the doctrine of being paid for attendance and loss of time, without reference to the circumstances of the patient. The man who pockets his fee, reckless of the distress and misery of the family from which it has been wrung, and in the next street receives but the same amount from a wealthy patient, surrounded with all the paraphernalia of pomp and pride, may say, “the loss of time and the services rendered have been alike in both cases, consequently I have got but my due: it is not for me to inquire into the pecuniary circumstances of my patients.” This is not the

language of the medical profession generally. The liberal portion of the faculty, which indeed is the mass, expect to be paid for advice and attendance in the ratio that is suitable to the circumstances of the highest, the middle, and the humbler classes of society.

It is a remarkable circumstance, that without referring to more distant quarters, the cardinal points of Dublin afford striking and permanent illustrations of the philanthropy of medical men. The founders of the following hospitals, Sir Patrick Dnn's on the east, Stephen's on the west, and the Rotunda on the north, were all three physicians; while the medical officers of the Meath, Dublin County Infirmary on the south, voluntarily transferred their salaries to the funds of the hospital.

We shall conclude the present subject by referring briefly to three out of the many benevolent physicians of our own times; the late Doctors Lentaigue, Percival, and Cheyne.

Doctor Lentaigue was so liberal of his professional services, that he was named "the poor man's doctor:" he was contented with whatever fee his patients could afford to give. Once a-week he gave a most comfortable, nay, elegant, dinner, at which he presided, to a crowd of reduced gentlemen.

Doctor Percival, not to speak of his uniform benevolence and high-mindedness, gave all the fees he had received on Sundays in charity.

May I ask, if there be any one here, that has been idle and thoughtless, and thinks that he cannot retrieve lost time and neglected opportunities? Do I address another that may be disheartened by the *res angustæ domi*? Do I recognise a third, conscious and justly convinced of the possession of high mental powers, and who is not prepared to make a successful struggle for fame and fortune—pre-

pared, I say, to rise above his fellow-man, and exact the homage due to superior intellect and genius? If there be any such amongst us, let him lend an attentive ear to this hasty sketch of a great and of a good man.

What does the biographer of the late lamented Cheyne, of this city, state: "While he (Dr. Cheyne) was assistant-surgeon, and surgeon in the artillery, from 1795 to 1799, his time was spent in shooting, playing billiards, reading such books as the circulating library supplied, and in complete dissipation." Thus were spent these four years of the life of a great man. But the sun then rose in the soul of Cheyne. Dr. Johnson compares him to Sheridan, after his maiden speech, which was a palpable failure, and most men would have despaired—not so Sheridan. "By —," said he, "'tis in me, and it shall come out." What was Cheyne's preparation? "He determined to become once more a medical student, and spent *nine* additional years in the study of pathology, and the practice of medicine, by patient observation, reading, and the experience of the best living authorities." After such preparation, did this physician, a candidate for professional distinction and professional success, require that his innate talents, his hard-earned knowledge, his worldly tact, should be bolstered up by the aid of riches to procure the eminence he aimed at? No. Cheyne was the architect of his own fortune. "In 1809 he settled in Dublin, neither expecting nor indeed wishing for rapid advancement. What is easily acquired is little valued, and often soon lost. He had a few friends, who were much dissatisfied with his apparent apathy, and the obscurity in which he lived. During the first six months of his sojourn in Dublin, he made only *three* guineas. In 1816, Cheyne's practice yielded him 1,710*l.*; in 1820, and for ten successive years, it was 5,000*l.*"

Did Dr. Cheyne feel *now* that fame was happiness, that eminence was happiness, that riches are happiness? Was he not ready to acknowledge with Young, that “the wish accomplished is the grave of bliss.”

I cannot give the reader a better description of a successful professional struggle, and the wear and tear of life, than that which the commentary of Dr. Johnson, upon the life of Cheyne, affords. It is drawn by the graphic pen of the editor of the *Medico-Chirurgical Review*, an eloquent Irishman—himself a successful struggler. He adds:—“We have followed Cheyne in his march up-hill; we see him at its summit; we are to see him going down. Such are the objects of human desires—sought with avidity—obtained with difficulty—enjoyed with disappointment—and often, in themselves, the source of irreparable evils. Success in a profession now-a-days, has entailed and entails, such labour on its possessor, that few who know its real nature, can envy it. Success means wealth and eminence, bought with the sacrifice of all healthy recreation, both of body and mind. The daily toil is relieved only by the nightly anxiety, and worn by almost uninterrupted exertion: the fortunate man is deprived of most of the social pleasures of life, and debarred from indulgence in its most cherished affections. He acquires property, loses his health, and often leaves the wealth of his industry to be squandered by children whom it demoralizes.

Sir W. Temple has justly observed: the vigour of the mind decays with that of the body, and not only humour and invention, but even judgment and resolution, change and languish with ill constitution of body and of health.

In 1831, when but fifty-five years old, what was the picture of Cheyne? His sleep was broken and unrefresh-

ing ; in the morning, he was languid and dispirited ; and in the evening he had a high degree of nervous fever." About this time, I one day had a conversation with this eminent physician : he had for some time before this, I am proud to say, looked upon me with the most friendly regard. Such a fall of snow had occurred, as rendered carriages and horses then useless. He came to the consultation as a pedestrian, with his usual punctuality. There stood the persevering, indefatigable Cheyne ! In despite of his illness, I think I never saw a countenance at once so handsome, and so intellectual. His full dark penetrating eyes beaming with intelligence, speaking his own thoughts, and at the same time reading mine. The flush of hectic was on his cheek, which lent a lustre to those fine sparkling eyes, that were doomed, alas ! so soon to be obscured by cataract, before they were closed by death. I was much affected at seeing the languid and depressed state to which he had been reduced, and said, " Could you not manage to limit your practice, husband your strength, and thus endeavour to recruit your health ?" Mark the wisdom and knowledge of the world evinced in his reply : " True," said he, " I could decline one third of my practice, but that would be a speedy mode of losing the remaining two-thirds." " He (Cheyne) once told Dr. Tweedie, that he had that day seen thirteen patients, all of whom were moribund, and that he therefore did not expect any of them to be alive on the morrow. This he said was too much for him ; he was unable to bear it, and he determined to fly from such scenes of hopeless and helpless affliction." It is strange that the aid, personal and pecuniary, that Dr. Cheyne afforded to temperance societies, as well as his religious habits, have not been noticed by his biographer. Temperance, which I am proud to

say, has now, in this city, grown to manhood, strong, healthy, and vigorous, was, in the days of Cheyne, in puny infancy. It was nurtured and cherished by his fostering care, in despite of all the ridicule *then* excited, by his sympathy and regard for the offspring of enthusiastic philanthropy. Cheyne's religion was not obvious—not obtrusive; it was a deep under-current in the course of his life, and *silent* because deep. It fertilized *unseen*, the soil from which sprang the wholesome fruits of active benevolence, sympathy, patience, and self-denying kindness. His biographer states: “His exterior department bore the appearance of indifference to the afflictions which were every day presented to him; but his sympathies, instead of being blunted by the habitude of meeting with such objects of compassion, were rendered more acute by the repetition. It is obvious that he possessed a degree of high-wrought sensitiveness, that preyed fatally upon an amiable disposition and benevolent mind.”

I have dwelt upon the life of this great man, because example is far better than abstract precept; for he has been in our own times, and thus affords a fresh and practical subject, from which, by a sort of running commentary, I have attempted to teach a useful lesson, and illustrate the claims which the medical profession may make upon the godlike attribute of benevolence.

I shall next beg to direct your attention to an attempt at explanation of the fact that medical men are said to be unfeeling. In cases of extremity, real or imagined, few of the crowd may be judicious and self-possessed. The medical practitioner is usually alone in this respect. From manifesting the firmness and coolness so necessary for the discharge of his all-important duties, he is often esteemed by the unreflecting as devoid of feeling, more especially

when the nature of the case requires perhaps a protracted and painful operation for the preservation of life or limb. The difference between the lay spectator and the practitioner is this: the former is the creature of his feelings, and is generally all absorbed by uncontrolled sympathy; his assistance is unskilful and marked by trepidation. The latter is from experience habituated to such scenes; his feelings are not absent, but controlled; they are, as it were, suspended, and superseded for a time, by the useful occupation of his mind, in determining what shall be done for the relief of the patient, by judicious, decided, and well-regulated treatment.

The surgeon's attributes have been thus described "the eye of a hawk, the heart of a lion, and the hand of a lady." To which we may add the practical pity of the good Samaritan—a sympathy quick to feel, a head and hand alike clear and steady to conceive and to execute.

One of the most distinguished men that the medical profession ever witnessed, was the celebrated J. Hunter. He was so engrossed with the prosecution of professional pursuits, that no matter what was his position—what the circumstances that surrounded him—he never lost sight of the one absorbing object. We will generally find that the man pre-eminently successful in any pursuit is found to take the same course. It is thus, that difficulties are surmounted by him who puts his shoulder to the wheel, *con amore*, and brings the "will invincible" to persevere with zeal and energy—nay, with enthusiasm, until the darling object shall have been attained. He will usually decline as a pursuit every thing that might divert him from the end in view; but he will engage with avidity in any occupation which he may esteem as subservient to that end. This is what we so commonly call devotion, and

indeed we might with propriety call such an object the idol of existence. So far as the accomplishment of the end in view, this devotion and zealous pursuit is most desirable, provided it be as the pithy Sallust describes;* but the wear and tear thus induced is very considerable, even in these legitimate pursuits. It is to be deplored that the individual by such exertions, does as much injury to his health as the idle devotee of pleasure, the debauchee, or the dissipated rake, and the frequenter of midnight revels. Both parties violate the rule before referred to, (p. 127,) that power and action should be always commensurate, and which holds equally good in every machine, animate or inanimate; add to which the cares and anxieties of the man of business, and the hopeless pursuit of happiness in the so-called road of pleasure.†

Dr. Johnson observes that the wear and tear complaint is almost peculiar to England, and explains why it should predominate in London so much more than in Paris, because in London business is the almost only pleasure; in Paris, pleasure is the almost only business. In this respect Dublin may be said to hold a middle place—neither so busy as the former, nor so idle as the latter; hence its inhabitants, generally speaking, enjoy good health. If Pat had the prudence of John Bull, would eschew gentility the besetting sin of Ireland, not ape his loftier

* Verum enimvero is denum mihi vivere, et frui anima videtur, qui aliquo negotio intentus præclari facinoris, aut artis bonæ famam quærit. Sed in magna copia rerum, aliud alli natura iter ostendit.

But he indeed appears to me to be truly alive, and to enjoy life, who is engaged in some useful employment, and endeavours to acquire fame by noble actions, or the practice of some commendable art. But in the midst of plenty, for that purpose, nature has pointed out to different men different ways.

† “No business is half so fatiguing as pleasure.”

and richer neighbours' habits, and consequently their expenditure, he would learn to live more contentedly and tranquilly in that state of life "into which it had pleased God to call him."

My countrymen are too vain to be proud, while the Englishman is too proud to be vain; hence the former is always striving for that extrinsic, to make his neighbours *stare*: the latter constantly working to produce intrinsic domestic *comforts* for himself and family.

Are we to look for an explanation of this in organization, climate, soil, and its productions? A learned friend of ours attributes a vast deal of the development, physical, moral, and intellectual, of the Irish, to—what do you think? You cannot guess!—you must "give it up!" Well, then, "*Potatoe-diet* is the cause of all!"

The following is, we think, an elegant, concise, and true description.

"To sum up the view of English, Scottish, and Irish, character, I may observe that sincerity and independence distinguish the English; intelligence and sagacity, the Scottish; and a gay and gallant spirit, the Irish. The best qualities, however, are apt to associate with bad ones. The independence of the English sometimes degenerates into coarseness and brutality; the sagacity of the Scottish into cunning and time-serving; and the gaiety of the Irish into fickleness and faithlessness. Could we combine the independence of the English with the sagacity of the Scottish, and with the gallantry of the Irish, we should form almost a god. Could we, on the contrary, unite the brutality of the first with the cunning of the second, and with the faithlessness of the third, we should form a demon." (*Walker's New Lavater.*)

It is strange that the inhabitants of Great Britain and

Ireland, so closely knit together by locality, government, common interest, and constant social intercourse, yet should be so dissimilar in national character. We shall have to consider this interesting subject when on the mental functions; and also to explain the influences produced by the position which the individual holds in society.

Madame de Stael disposes of the several grades of the English, in a pithy sentence—more terse than just—when she states that they are like their malt drink—the top all fraught, the bottom all dregs, but the middle excellent.

Moderate exercise of mind and body produce that half-weary, half-pleasurable lassitude, which sweetly invites to repose. Excessive labour of either mind or body, or both, more especially when conjoined with much care and anxiety, commonly produce a feverish condition, which dissipates sound sleep, rendering that which occurs dreamy and unrefreshing, so that the man, jaded either in mind or body, seeks in vain for the refreshment and alacrity afforded by sound sleep. How often have we heard the state of such an individual described as similar to that which occurs when too much wine had been taken over night. The leaden hand of Morpheus is now most unseasonably upon him when business, constant business, calls him from his weary couch. It is not until he has performed his morning ablutions, &c., that he feels wide awake, and fit for daily avocations. A friend of ours, of over active mind, says, that a cold shower bath and brisk friction with horse hair gloves, prove more refreshing than his bed, from which he often rises more weary than when he lay down. Should circumstances permit a morning sleep, even after the restless night, it proves not only unrefreshing, but stupifying in its effects. Mental labour, care and anxiety, bring with them “oft in the stilly night”

wakefulness, or which is still more distressing, vigilant, and dreamy sleep to the pillow of the humble and anxious drudge, as well as to that of the first adviser of majesty, or even majesty itself; for Shakespeare has well observed, "Uneasy lies the head that wears a crown." Absolve the man of business from his post, give him a loose leg, and perfect, full exemption from the cares of business; send him on a little tour of recreation, and now sleep, "gentle sleep," sound and refreshing, soon steeps his senses in forgetfulness. Next morning sees him rise with elasticity of mind and body, to which he had been formerly a stranger. We need scarcely remind you that the moral and intellectual attributes, which are brought into play constantly in man's ordinary avocations, are as much objects of consideration in physiology, as his physical functions. This has been abundantly proved in the first lecture. Plato asserted that all diseases of the body proceed from the mind or soul. Dr. J. Johnson has truly said that "the operation of physical causes upon the corporeal fabric, numerous as these are, dwindles into complete insignificance compared with that of anxiety, tribulation, discontent, and, I may add, *ennui* of mind." Here we have the professions overstocked, the niches in trade filled up, the eager and anxious struggle for subsistence on the one hand, or the ambition which aims at wealth or fame, or both, on the other. Success must be hardly earned by *all*: there is no royal road to the goal, and in the race of intellect how much occurs to harass both mind and body.

There is another useful lesson to be learned from the admirable practical course pursued by this great man, Dr. Cheyne. I allude to the wish he evinced to concentrate his energies.

In 1815, when appointed physician to the House of

Industry, he resigned his professorship at the College of Surgeons, as well as his charge at the Meath Hospital.

Two advantages are gained by such conduct: firstly, the individual resigning is enabled to devote his attention more fully to the important and paramount calls of practice; secondly, he makes room for a less employed candidate, aspiring in his turn for professional fame and eminence.

Now, although none of you would wish, I trust, to purchase fame or wealth at the expense of health and happiness, still it is the intention of us all to live by our common profession.

Time warns me to be brief on the subject of professional remuneration. Medical services are a thing in the market, and like articles which are every day bought and sold, we may say that, in public estimation, they are placed in three positions—top, middle, and bottom.

Well, Dr. A. has won his way, and is, as it is called, one of the heads of the profession. I am sure from what I have already stated, you cannot imagine for a moment that this has been effected without labour, without talents, without cleverness, without tact. I never parted from a man in this position, without being deeply impressed with the conviction, that all these attributes were concentrated in a pre-eminent degree in the successful practitioner.

Well, Dr. B., the middle man, is industrious, and we will say possesses all the attributes,—so well known to the public,—and which are so fully developed in Dr. A.; but there is a property in physics, which also holds good amongst physicians—it is *impenetrability*: that is, two bodies cannot exist in the same place at the same time. So that Dr. B. cannot be Dr. A.—to use an Irishism—until the former gets upon the *top* platform.

We now come to Dr. C.: he happens to have, although

at the bottom of the list, a lucky initial; for it is that of men who have already proved to be stars in the medical world. Well, he may have all the talents and all the industry associated with the great names indicated by this initial; but he is, as yet, an untried man, because he is a junior. Dr. B. is before him, as Dr. A. is before Dr. B., and consequently he must wait his turn for professional eminence and public estimation and confidence.

It is indeed a popular error to conceive that the remuneration obtained by the medical practitioner is cheaply and easily earned. This will be put in a clear point of view by mentioning that Dr. C., an eminent practitioner, was asked by his friend, how he could think of taking two guineas for a *short* consultation visit. What was the physician's reply? "Don't you know," said he, "that I have been earning that fee ever since I went to school, and that is now very many years ago."

It was justly observed, for what is the purchase the patient makes with his fee?—educated mind. Is it not the advice of a man who has made an immense outlay of time, money, labour, nay, often of health itself, all to fit him for the duties of a professional adviser or operator, in a matter concerning life and death?

The late Surgeon M'Evoy, of Dublin, when congratulated upon the fame he had earned, and the wealth he had acquired, replied, "I knew most of happiness and contentment when I dined for eighteen pence, and had no more in my pocket."

Dr. Johnson, who has watched and noted the "stream of human life from the cradle to the grave," with the eye and ability not only of a profound physician, but as a philosopher and philanthropist of the first order, has touchingly observed of himself, what we shall all have, in our

turn, to echo, when “the race of competition is abandoned—the goal of ambition has dropped the mask, and assumed its real character—the scoffing TERMINUS of man’s vain hopes—the withering finger-post pointing to the tomb,” forcing us to exclaim at last, “There’s nothing bright but heaven.”

*“Est modus in rebus ; sunt certi denique fines
Quos ultra citraque nequit consistere rectum.”*

Need we add another word to induce you, my young friends, to adhere to the happy medium ; but if you should err in this respect, let your “failings lean to virtue’s side,” to labour and toil—the handmaids “that lead to the Elysian fields,”—rather than to pleasure and sloth ; for it has been amply proved by observation and experience, that the nearest approach to happiness in this life will be found in the daily occupations of a successful struggler, guided by judgment, perseverance, and industry, united with the “power of mastering the mind”—requisites much more essential for every day business and professional success, than great talent and towering genius.

LECTURE IX.

WE must indeed acknowledge the difficulties that encompass us when we come to lay down rules, that will be suitable for all, in reference to physical and moral matters ; enabling them to preserve the “even tenor” of their way, and to enjoy the greatest of all earthly blessings—a sound mind in a healthy body.

We need not remind you of the tendency of the majority to run into extremes—either Scylla or Charybdis—sloth

or toil. Again, we are such creatures of imitation and habit; so constantly and fallaciously arguing from the particular to the universal; none of us, we must admit, is content at the end of his tether. It is the age of locomotion; the demon of the day is ever shouting out, or whispering, "Onward—go a-head."

While ever progression is possible, the spur of emulation, of ambition, or of avarice is felt without ceasing at the side of their jaded votaries in pursuit of—so called—happiness, deceived by the "fairy promiser of joy;" for

"What is Hope? The puffing gale of morn,
That robs each flow'ret of its gem, and dies;
The cobweb hiding disappointment's thorn,
Which stings more keenly through its thin disguise."

We selected Cheyne's professional progress as a *home* specimen of the wear and tear of human life, consequent upon unceasing toil, mental labour, and corroding anxiety, while in the pursuit of fame and wealth.* Before we part

* The pursuit is often—too often the sad health-undermining struggle, not for fame nor fortune, but for a scanty subsistence. The contrast between the English country gentleman and the professional drudge, as well as the case of Brain and Hands *versus* Money and Lands, were well and ably stated by an eloquent advocate on a late occasion in the following terms:

"It is unjust—it is all but iniquitous to tax at the same rate the intellect of one man and the acres of another. Look at your English country gentlemen—the proprietors of hereditary possessions—with every comfort which wealth can bestow or health prolong, in the daily enjoyment of the most salubrious pursuits, exempt from every mental care, and affected by no discomfort, save what Edmund Burke characterized as the laborious lassitude of having nothing to do; look at him, secure in the retention of his great estate—transmitting it unimpaired to a line of posterity as long, perhaps, as that ancestry through which, to him, it has been unfailingly transmitted; and then turn to look upon the professional man, engaged from morn to night, and from night till almost break of day, in the most laborious occupations from which a

the medical man, let us look *abroad* at human nature in this department, and we will find that although Paris is esteemed the capital of pleasure, yet there the most distinguished sons of science are as elsewhere, and every where, alike the victims of ambition, envy, and uncontrolled mind. It has been well remarked, that "there are some features which in people of genius are always the same. They are uniformly dissatisfied, restless, longing after something better, nobler, higher than the present life. They are awkward in little things, benevolent, modest, yet ambitious; with violent passions, and a long train of virtues or vices, according to the direction which these passions happen to take."

precarious subsistence is derived; but you can mark only the toil he endures: who, alas! can tell the feelings of anxiety which he must experience—who can mark the consuming excitement, the constant sense of insecurity, the perpetual apprehension of the period when of his support may be deprived those who are dearer to him than life itself, and may, perhaps, be reduced to positive penury? Look, I say, to these two pictures—you know they are not imaginative—and tell me if it be just, if it be fair, if it be humane, that on both of these two the income tax should press with equal weight? Is it just? I appeal to you, of whom so many I observe around me—you, born to affluence—you, who never knew the care of a to-morrow—you

Gentlemen of England, who live at home at ease—

you, who never drank of adversity's bitter cup—it is of you I ask whether it be just that on you, and the great capitalists of this land, should be levied no greater impost than is exacted from the hard-working professional, from the clergymen of a small living, from the officers of our two gallant services, from all those classes who, with slender means, have a desire to educate their children as gentlemen, and are of all others entitled to our sympathy and respect; from the poor widows with their limited jointures, supporting, perhaps, their families; from small tradesmen, who eke out a wretched subsistence by devoted toiling at business for twelve or sixteen hours a day; is it just to levy from all these this oppressive tax, and to put it to their consciences to make the confessions by which liability is to be estimated?"

The following observations upon the lives of two eminent foreign medical men are so judicious, so truly philosophic, that I shall no doubt be pardoned for introducing them here, as affording such a striking illustration of the inevitable wear and tear, and premature decline of life, consequent upon the absence of mental control, and strict moral discipline :

* “ It is useful to every one to muse occasionally on the characters of the leading men in our profession, especially after they have been withdrawn from our eyes, and when all partiality and prejudice have ceased to influence our judgments. The lives of such men as Dupuytren and Richerand may suggest many a useful hint to the medical practitioner. Both were gifted with great talents, but both, alas! were destitute of that well-adjusted poise of mind, and that guidance of the higher moral feelings, without which, although intellectual and professional eminence may be attained, the real prosperity of personal happiness and of cotemporary respect is not to be won. Let it be ever borne in mind that no person can continue to give way to the impulse of any one extreme and energetic feeling, without compromising his own comfort and welfare. Dupuytren and Richerand suffered most bitterly from this fatal mistake. And what has been the result? Not only were they unhappy in themselves, but they also failed in doing for science what science had a right to expect from them. Both of them died in the strength of their age, worn out less by the decay of their bodily powers, than by the corrosion of mental anxiety and disappointment. In the latter years of Dupuytren's life, notwithstanding his ever-increasing celebrity and worldly success, the care-worn

* Medico-chir. Review, April, 1842, p. 531.

expression of his features, and the cold mechanical smile that often played upon his lips, indicated too clearly the inward distress and deep-rooted melancholy which was preying upon his soul. The germ of death was already sown. His reputation with posterity will not be at all commensurate with the great fame which he had in his day. Richerand, on the other hand, vexed at the acknowledged superiority of his rival, wasted his talents in angry contentions, and at length gradually retired from the field, in which, had he been satisfied with the second command, he might have won honourable laurels. The manhood of his professional career by no means fulfilled the bright promise of his early days; not that his capacities and attainments had at any time been over-estimated, but simply because they were not directed in a right course, nor matured under the fostering influence of a peaceful and contented spirit."

I should hope that the foregoing observations read a lesson applicable alike to us all, no matter what may be our professions or callings. We have selected the medical man throughout as *dramatis persona*, to illustrate that which belongs to human nature in all its departments, in every age, in every clime. Those practical hints may be readily referred to each one of the public in his individual character: "*Mutato nomine de te fabula narretur*;" or as Nathan said to David: "*Thou art the man.*"

We are not disposed to trust much to the so called specifics; but we cannot withhold our assent to the true panacea proposed for those ills by Dr. Abercrombie, in the following terms:

* "*Among the phenomena presented by human character,*

* See "Mental Culture," Dr. A.'s admirable little work. A treasure for one shilling.

none will strike you as more remarkable than the various objects which men propose to themselves in this life. In all, a certain vision of happiness seems to float over the scene; but how various are the courses by which the phantom is pursued? and how many enter upon the pursuit without proposing to themselves any definite course at all? They never seem distinctly to put to themselves the question, in what the imagined enjoyment consists, and what are the elements by which it is constituted? One expects to find it in wealth—another in power—a third in rank—a fourth in fame—while not a few are found to seek it in a mere round of excitement, perishing with the hour which gave it birth. Thus a large proportion of mankind pass through life, pursuing an imagined good, which too often eludes their grasp, or which, even after it has been attained, is found incapable of giving satisfaction. They live upon the opinions of other men, and are thus left at the merey of a thousand external circumstances, by which the good they had so long pursued is blasted in the enjoyment. They enter upon life without forming any definite conception of what the great business of life ought to be; and when they perceive that it is drawing to a close, they look back with astonishment to find that it has passed over them like a dream; that they cannot say for what purpose they lived; or perhaps are compelled to acknowledge that they have lived in vain.

But life presents another aspect, when we view it as a scene of moral discipline; when we look not at its pains and its pleasures, but its high duties and its solemn responsibilities, and at the discipline of the heart, from which springs a true and solid happiness which external circumstances cannot destroy. All, then, is defined and clear; the object is definite, and the way to it is marked as by a

light from heaven. Each step that is gained is felt to be a real and solid acquirement, and each imparts a sense of moral health, which strengthens every principle within for farther progress. I know that I carry your best feelings along with me, when I thus call your attention to that course of life which alone is adapted to its real and solemn importance—which alone is worthy of those powers of our intellectual and moral nature, with which we have been endowed by Him who formed us. In the culture of these is involved not only a duty and a responsibility, but a source of the purest and the most refined enjoyment. For there is a power which is calculated to carry a man through life, without being the sport and the victim of every change that flits across the scene;—this power resides in a sound moral discipline, and a well-regulated mind.”

We have prolonged the consideration of professional pursuits and of every day business so much, that time warns us to conclude this portion of the subject, which we shall now do by directing your attention to a few brief observations in reference to this department.

It may be inferred from what we have already stated, firstly ; that it is as essential to health as to success in any lawful pursuit that we should be governed by a principle of regularity and order. Besides the grounds of this rule, which are obvious to all, arising from the impossibility without order carefully observed of pursuing any system of dietetics and regimen, it will be evident that irregularity in the discharge of one duty or pursuit, must lead to the disturbance or total omission of all the other prescribed duties. (See p. 128.)

Secondly ; when there is occasion (and when is there not ?) for any mental application, it will be found that the

mind is in fullest vigour for a few hours after breakfast. In fact it is well known to all engaged in literary labour, that the period immediately succeeding this repast is what is called "the cream of the day." The reason is pretty obvious : all the wants of the system are by that time either sympathetically or actually supplied ; and as the body may be compared to an instrument upon which the mind as it were plays, we should naturally look for the happiest efforts when the instrument is in full tune.

Breakfast generally consists much more of fluid than of solid material. Beaumont has shown (p. 77) that most fluids are not affected by the gastric juice, but pass off from the stomach soon after they have been received. This accounts for why we are equal to either corporeal or mental labour so soon after breakfast ; while owing to the more solid and heavy nature of the supply at dinner, we are naturally averse to any exertion either of mind or body for some time after this meal. It is well known that liquids recruit the strength, when received by the stomach, more quickly than if solids be taken under similar circumstances. It is obvious that the first effect produced by the ingestion of food is upon the nervous system, for the feeling of languor and weakness is removed long before either liquid or solid food could be absorbed. The stomach appears to exercise a discriminating power in such instances. It should also be recollected, that the wants of the system in infancy are supplied at first by liquid nourishment.

Thirdly ; avoid, if possible, prolonging your ordinary occupation beyond the moment at which you feel your attention flags : but you must not confound this feeling with indolence, or an indisposition to exert that control and discipline of the mind which is so truly characteristic of the man of business, and without which you are the slave

of each passing contingency. But there are occasions when an individual of the most industrious habits feels he is unequal for further energetic effort—when his attention can no longer be kept fixed, and his memory fails to be as faithful as usual; recollect the rule of *non quantum sed quam bene*: nor don't spur, when jaded, the willing horse.*

Fourthly; if your occupation should be of a sedentary nature, tax your ingenuity to find, if possible, without any material interference with your duties, a means of change, occasionally of your body, more especially of your lower limbs. The late Commissioner Parsons, when very much employed with chamber practice as a barrister, mentioned an ingenious mode of effecting this object, which he had adopted. It was by placing the inkstand at one extremity of the study, and his books and brief at the opposite side. This arrangement of course compelled him, of necessity, to walk to and fro, when he required ink. A change of pursuit or study is often found to produce some of the relief obtained by absolute rest; which, if we recollect aright, was the only kind of relaxation Lord Brougham had permitted himself to enjoy before he attained the eminence his ambition had aimed at. Recollect, that we do not recommend this plan but as a substitute when there's no choice, nor do we think any individual should put himself into such a position, as to render relaxation and out-of-door exercise during some portion of the day unattainable. We think that the end does not always sanctify the means, more especially when

* A gentleman obtained, with considerable eclat, a fellowship in T. C. D., to the no small surprise of his friends, because they were aware that he had not been a reading man. When asked how he contrived to obtain the necessary information, the fellow replied, "True, I read only one hour a day, but then, I thought the rest."

the latter leads inevitably to habits which undermine the health both of body and of mind.

The subject of digestion has already detained us so long that we are constrained now to concentrate our further observations, and direct them chiefly to the concerns of the valetudinarian ; more especially as this personage is privileged to be fastidious and irritable, consequently he cannot be put off with brief speech. Accordingly we shall, having dismissed the subject of every day business, proceed to consider what chiefly belongs to him, under the following heads : 1. Exercise and air ; 2. Enjoyments ; 3. Articles of food ; 4. Period of meals ; 5. Sleep ; 6. Modifications, contingencies, &c. ; 7. Recapitulation and conclusion.

With reference to exercise, we need not spend much time in proving how necessary this is, both for our general comfort and the preservation of health. When we observe a certain anatomical development, we may infer it has been ordained, that this apparatus should discharge its appropriate function, for nature never creates anything in vain. In man and most animals the organs of loco-motion—bones and muscles (flesh)—constitute the main bulk of the body, consequently we must be inevitably led to conclude, that exercise, either in the form of labour or otherwise, is indispensable. This rule of determining the function by the anatomy comes home to every one with the force of mathematical reasoning. It is also in reference to this mutual relation of means and end that the division of temperaments takes place—hence, we say of one whose limbs are large and bulky, that he is of the muscular temperament. It is plain that this individual was formed for a life of corporeal exertion. Should such a one, either regardless of nature's decree, or constrained by necessity, lead an inactive life, he will be punished for disobeying the laws of organization, and disease will finally

be the inevitable result. We are wiser in our conclusions and practice with relation to the brute creation than in reference to ourselves. How well we estimate the comparative merits of horses and dogs, and the kind of labour or exercise each is suitable for in respect to their muscular development. When upon the subject of the skeleton and the active agents of loco-motion, we shall have occasion to consider bone and muscle then, somewhat in detail; at present it is our purpose to speak of these structures generally, and in reference to loco-motion as related to the function of digestion.

Exercise may be active, passive, or mixed. Walking is an example of the first, that of a carriage or sailing of the second, and riding on horseback of the third, to which we may add that which takes place without motion of the body, by friction, &c.

We shall briefly consider each of these modes in the order above mentioned. Firstly; *active* exercise.—Walking appears to be that intended for us by nature, it is what we are fondest of, engages uniformly all the loco-motive parts of the body, promotes circulation, respiration, &c.—its endless modifications in reference to our rate of progression from slow motion—creeping—to running, leaping, dancing, &c., are alike applicable to the power and inclination of the tardy and the quick, the feeble and the strong. We are all aware of the buoyancy and exhilaration produced by a walk in the pure open country air. He who takes this exercise is enabled to increase considerably, by cautious degrees, the distance; but this rule must be ever borne in mind that *fatigue* ought on all occasions be avoided. The valetudinarian should recollect that he has to return, and consequently ought to husband his strength. It is always desirable to have some other object in view—a visit to a friend, some little business, &c., people in general are

averse to go out for the mere walk. We must never lose sight of the necessity, on these occasions, of employing the mind. The dyspeptic should, if possible, enlist some agreeable companion in his walks. Thus, exercise, pure open air, pleasing scenery, and the lively conversation of a kind and considerate friend, all conspire to divert and sooth the spirit of him who, if left to his own thoughts, would move mopingly along engrossed with the horrors of his invalid condition. Sometimes a walk to an adjoining spa, or to drink goat's whey at Dundrum, will be found much more efficacious than exercise, only the latter should be associated with some medicinal or dietetic plan. We have known all the credit of a cure having been given to dandelion and even watercresses, when the healthful walk into the country to procure them had been altogether overlooked. We have already cited several remarkable examples of our credulity in this respect. (See leet. 7.) The following story by Voltaire, will serve to illustrate still further this truth in reference to exercise :

“Ogul,* a voluptuary, who could be managed but with difficulty by his physician, on finding himself extremely ill from indolence and intemperance, requested advice :—‘Eat a basilisk, stewed in rose-water,’ replied the physician. In vain did the slaves search for a basilisk, until they met with Zadig, who, approaching Ogul, exclaimed, ‘Behold that which thou desirest ; but my lord,’ continued he, ‘it is not to be eaten : all its virtues must enter through thy pores : I have therefore enclosed it in a little ball, blown up, and covered with a fine skin ; thou must strike this ball with all thy might, and I must strike it back again, for a considerable time, and by observing this regimen, and ta-

* Paris’ Pharmacologia, p. 52.

king no other drink than rose-water for a few days, thou wilt see and acknowledge the effect of my art.' The first day Ogul was out of breath, and thought he should have died from fatigue; the second he was less fatigued, and slept better; in eight days he recovered all his strength. Zadig then said to him, 'There is no such thing in nature as a basilisk, but thou hast taken exercise* and been temperate, and hast therefore recovered thy health.'

Dr. Paris adds, "But the medical practitioner may perhaps receive more satisfaction from a modern illustration; if so, the following anecdote, related by Sydenham, may not be unacceptable:

"This great physician having long attended a gentleman of fortune with little or no advantage, frankly avowed his inability to render him any further service, adding at the same time, that there was a physician of the name of Robinson, at Inverness, who had distinguished himself by the performance of many remarkable cures of the same complaint as that under which his patient laboured, and expressing a conviction that, if he applied to him, he would come back cured. This was too encouraging a proposal to be rejected; the gentleman received from Sydenham a statement of his case, with the necessary letter of introduction, and proceeded without delay to the place in question. On arriving at Inverness, and anxiously inquiring for the resi-

* We need scarcely, after this example, say how much we recommend the exercises of the gymnasium and fencing, and also the "Ladies' exercises." On *very* wet days, the skipping-rope or shuttlecock will afford a healthful pastime: as this is home exercise, and expands the chest, we would recommend our fair young friends to dispense with stays on these occasions, or, if worn, they should be short and loose. We may also add that our *own* morality is not so tight-laced as to forbid the elastic, airy thread of youth and beauty, through the mazes of the sportive and healthful dance.

dence of Dr. Robinson, he found, to his utter dismay and disappointment, that there was no physician of that name, nor ever had been in the memory of any person there. The gentleman returned, vowing eternal hostility to the peace of Sydenham, and on his arrival at home, instantly expressed his indignation at having been sent on a journey of so many hundred miles for no purpose. ‘Well,’ replies Sydenham, ‘are you better in health?’ ‘Yes, I am now quite well, but no thanks to you.’ ‘No,’ says Sydenham, ‘but you may thank Dr. Robinson for curing you. I wished to send you a journey with some object of interest in view; I knew it would be of service to you; in going you had Dr. Robinson and his wonderful cures in contemplation; and in returning, you were equally engaged in thinking of scolding me.’ Had the patient been sent on a journey without the contemplation of some plausible object, the result would probably have been less satisfactory; we see, therefore, how much more sagacious was Sydenham’s prescription than that of Hippocrates, under similar circumstances, for he sent his patients from Athens to Megara, with no other object than to touch the walls and return.”

It would, no doubt, prove highly beneficial to public health, if a standard time-piece were placed at the Phoenix in the Park near Dublin—and that this clock should be the grand regulator: “the corrector of the sun.” How many would be then induced to walk or ride into this splendid Park—perhaps the finest in the world—in order to regulate their watches, instead of strolling up sunken Saekville-street to take a peep at the post-office oracle. It would be truly becoming for the visitors of a Phoenix to rise, if not out of the ashes, at least out of the smoke of the city, and thus become, like the prototype, regenerate in health and vigour by the ascent. As a rule, our walks should be, if

possible, in the clear pure atmosphere, for "God made the country, man the city."*

Passive exercise.—When the individual is too weak for walking, or the mixed exercise of riding on horseback, then we must substitute for these the conveyance by some form of carriage. All the different kinds of vehicles may be reduced to two classes, open and close. When the valetudinarian can bear the exposure, the former is greatly to be preferred. Our experience of all the *half* covered vehicles is unfavorable. You will find that even the robust are disposed to take cold in such carriages. If the weather and season prove favorable, the valetudinarian may drive into the country, and when in a fine upland dry position, he will generally find himself equal to a short walk; having the carriage at hand he will be able to resume it before fatigue shall have occurred. It is well known that the individual who on leaving a city had to be helped into his carriage, will be so strong, after a drive of some miles in the open bracing and exhilarating pure air of the country; that he shall be able to alight, and even walk about with a degree of strength and buoyancy that surprises himself.

Sailing is a very desirable form of gestation, provided the dyspeptic can undertake it without apprehension; if this should occur in any form of exercise, it would more than

* The vital portion (oxygen) of equal measures of air, is the same, both in the city and in the country. The vitiated condition of the former is caused by impurities resulting from respiration, combustion, animal exhalations, &c. Mr. Farr, the Registrar-General, has ascertained from the census returns, that the mean duration of life in the two classes of districts—towns and rural places—differs by nearly seventeen years, the average of life being fifty-five years in the country and only thirty-eight in the towns. The density of the population in the country districts referred to, compared to that in the towns, is as 10 to 242; the mortality as 100 to 144.

neutralize the proposed advantage. A nervous friend of ours declared that his hydrophobia had been so great on all occasions, that a fit of indigestion followed upon his crossing in a row boat a narrow ferry. Several *in-door* modes of exercise, as spring boards and spring chairs, have been recommended as substitutes for carriage exercise; but *all* such fail in producing that salubrious exhilaration which the open air only can realize. There are some who will not go abroad, more especially if the day be not most inviting; we would say to them, home exercise is better than none at all.

The third form of exercise, the *mixed*—of which riding on horseback gives us a familiar example, is most desirable for the valetudinarian, particularly if he should labour under a sluggish or torpid condition of the bowels; the shaking and compression which the abdominal organs undergo favour the action of the bowels directly and indirectly: by referring to pages 118, 119 & 121, it will appear how this exercise must cause the free descent of bile from the liver, and a vigorous contraction of the muscular coat of the intestinal canal.*

The several paces of the horse in walking, trotting, and galloping, enable the dyspeptic to determine the rate of progression and the degree of shaking that he may find most suitable.

Friction and *pressure* are used when the invalid is so weak as to be unable to bear any other exercise. The former may be well employed with horse hair gloves, particularly over the region of the abdomen, for reasons already mentioned. Philip states, that “It (friction) is the principal exercise among the higher rank of some Asiatic nations, and was used both by the Greeks and Romans after they be-

* This effect is observable in reference to horses themselves, when taken from the stable for exercise or work.

came luxurious ;” and he adds, “ that mere pressure is a mode of exercise inferior to friction ; but, if generally applied to the limbs in an interrupted manner from the valvular structure of the veins it has a considerable effect in promoting the circulation.” Indian rubber bandages, accurately applied, will often so brace and strengthen the muscles of the lower limbs,* as to enable the invalid to walk, who, without this aid, had felt such exercise impossible.

Enjoyments.—Under this head we have to consider what it is difficult to define in reference to people in general. Our physical, as well as our mental tastes are almost as different as our faces and figures. Each is ready to exclaim, “ It is a matter of surprise to me that Mr. A. can find so much enjoyment in business—eternal business—night, noon and morning.” Again, Mr. A. says, “ Well I wonder how Mr. B. can continue to live in what *he* calls a round of pleasure and amusement.” Each sees the mote in his brother’s eye, but observes not the beam in his own. In other words, is tolerant of his own folly only. Change or variety appears to be desired by all, unless by those labouring under a species of monomania. The traveller—by occupation—sighs for rest, while he, doomed to drudge in the same locality, longs for the freedom of a loose leg and change of scene ; all illustrate the truth of Horace’s maxim :

“ *Qui fit Mæcenæ ut nemo contentus vivet.*”

In truth enjoyment is quite a relative idea, depending upon a host of contingencies, such as age, temperament, habit, peculiarities, &c. The influence of age or period of life, needs not a reference to the sacred Scriptures to prove its well known effects.

* The Irish peasantry when they undertake long journies on foot, often invest their legs with hay ropes, owing, doubtless, to a practical knowledge of this circumstance.

In childhood, manhood, and old age, we make a retrospect *tete-a-tete* with Experience, not at all complimentary to the preceding stage—and although we may cast “a longing lingering look” on boyhood’s days, owing to the pleasures they *then* afforded; yet, still, we too often regret that so much time was idly spent.* The objects of ambition or of avarice—unlike the straws and rattles of childhood, or the finely gilded toys of the emulation of riper years—are persistent besetting delusions to the very last—even on a death-bed.

The conqueror still sighs after fame—darling fame—that “nerved his arm and steeled his sword.” The miser hugs his money-bags and petitions Death to spare him yet a little until he receives some valuable post obits. We have *heard* a great deal of how valueless the things of this world appear to the dying man; but we have too often *seen* the reverse to give assent to this assertion as the rule, which forms but the mere exception; men generally die as they have lived, “The ruling passion strong in death.”†

On the subject of enjoyments, we can only say, that each individual must determine upon what he likes best in this respect, and act accordingly. The man who pays most attention to the culture and discipline of his mind, is laying the true and firm foundation for such a taste as will lead him to seek for enjoyment in moral and intellectual‡ pur-

* “Those days of old, when Youth was bold,
And Time stole wings to speed it;
And Youth ne’er knew how fast Time flew,
Or knowing, did not heed it!”

† A late baronet, on the day of his death, had himself carried to a window which commanded an extended view of his magnificent demesne. He exclaimed, after surveying the sylvan scene, “Ah! must I then leave you, B—l Park!”

‡ The Vicar of Wakefield showed, that “books were sweet unreproaching companions to the miserable, and that if they could not bring us to enjoy life, they would at least teach us to endure it.”

suits, those that leave no sting behind. Remember that the pleasures of the sensualist and of the voluptuary perish in the very enjoyment.

I shall dismiss this subject with the consideration of a state which is best described by *ennui*, in which the healthiest of us are too often found, and are then as incapable of enjoyment as we are of undertaking business. If we attempt either, we do so in a listless languid way, which inevitably fails of attaining the desired result. Whenever this state is recognised, we should allow the transitory fit of mental or physical depression to subside. With some this condition is periodical; but we are not to give way on all occasions, nor confound indisposition with inability. I would have you understand that *ennui*, although very like indolence, is not identical with the latter. The most active mind is often invaded by the former, which bestrides it as an incubus, prostrating and paralyzing the energies of him who glories in employment, and whose motto is "*work*."

Articles of Food.—We have already shown (p. 91, 92) from Magendie's experiments, the importance that should be attached to the variation of diet; and also, that Dr. Prout reduced all the articles of nourishment among the higher animals, to three classes: 1. The *saccharine*; 2. the *oily*; and 3. the *albuminous*. In Lecture IV., p. 99, a condensed view of the relative digestibility of the different kinds of food, was given, according to Dr. Beaumont's experiments on St. Martin, to which were added, some observations upon condiments and ardent spirits. As we have entered already, pretty fully, into the consideration of the articles consumed at breakfast, it next only remains to consider, briefly, those used at dinner, more especially in relation to the valetudinarian, reserving for a future occasion, the modifications or changes required in reference to age,

sex, temperament, &c.; the adult male being the individual we have now to deal with.

We have before shown that all the articles employed in diet may be reduced to either of the two great divisions, animal or vegetable: at page 95, we alluded to both the proximate principles and ultimate elements of these substances. The former are, in animal food, fibrin, albumen, (white of egg,) jelly, oil, &c.; in vegetable aliment they are gluten, farina, (starch,) gum, oil, and sugar. The latter in animal substances, are oxygen, hydrogen, carbon, and nitrogen; the last in *large* quantity. Vegetables contain oxygen, hydrogen, and carbon, and are either *without nitrogen* or contain it in small quantity only. It would be reasonable to suppose, that animal food approximating so much both in its proximate principles and ultimate elements to the nature of our own bodies, ought to be that almost exclusively employed; but, observation of the masticating and digestive apparatus throughout of man, and the results of experience have shown, that both kinds of aliment should be used in order to preserve his health. The region we inhabit, seasons, habits, &c., influence our choice most materially in this respect. The hardy Irish peasantry are strong and vigorous, although living on a diet almost exclusively vegetable.

The following is from "*Book of the Farm*:"

"Every part of a plant contains nitrogen as well as carbon; but, as an invariable rule, the seed of all plants contains a much larger quantity of nitrogen than the leaves and stalks, and a lesser quantity of carbon, and inversely, the leaves and stalks contain a much greater quantity of carbon, and a lesser quantity of nitrogen. Now, when the horse is fed on grass, his food consists almost entirely of carbon; and the result is, that with a sufficient supply he gets fat—

that is, that particles of oily, fat matter, are deposited on the muscles under the skin; but, as it is well known, a horse in this condition is quite unequal to any work, and the least exertion reduces its bulk. But when the same horse, under other circumstances, is fed on corn, his food consists principally of nitrogen; and although he may never, under this keep, get as fat as on the other, still the increase he does acquire will be pure muscle, or, as it is technically termed, sound flesh; and on this keep he can perform infinitely more work, with less fatigue, than on food containing no nitrogen. A more complete instance could not be adduced to show that animals, as well as plants, can only assimilate that food which is presented to them; in the first place, carbonaceous matters being the food of the horse, carbon is deposited in the shape of fat; in the latter, when more nitrogen enters into the composition of his food, the deposit of muscle preponderates. So it is with wheat. With a manure that only supplies carbonaceous matter, starch is the result. With a manure containing nitrogen, gluten is formed; both cases being completely analogous, and affording unerring proof of one simple and unerring law."

Richerand says, "Living bodies are real laboratories, in which there are carried on combinations and decompositions which art cannot imitate: methinks one may infer, that the power of nature in the composition and decomposition of bodies far exceeds that of chemistry." He adds, "The excrements of a hen fed for ten days on oats only, on being calcined and analyzed by M. Vauquelin, produced twice as much phosphate and carbonate of lime as was contained in the oats, with a small deficiency in the quantity of silice, which might have been employed in furnishing the excess of calcareous matter; a transmutation depending on the

absorption of an unknown principle, to the amount of nearly five times its own weight."

Now let us take the familiar examples of the colt, calf, and lamb. All feed on grass—perhaps on the same pasture, when they arrive at maturity; they may be fat no doubt, but they have put up flesh also. Look at the display of blood, bone, and *muscular* beauty of the thorough-bred four year old, that will, on or off grass, never grow fat: observe, either in the market or at table, beef and mutton, and you will at once conclude, that in the growth of the ox and the sheep the development of muscle *preponderates* over that of fat. Magendie states, "That the nations which feed on rice, maize, or *potatoes*, (aliments possessing little or no nitrogen,) take also milk or cheese." We could, from personal knowledge, point out districts in Ireland, where—miserable to relate—many of the peasantry are specimens of vegetable-feeders, in the exclusive sense of this appellation. When on the subject of salt, it was mentioned at p. 105, that when the destitute Irish cannot procure milk—even butter-milk—they dissolve salt in water, into which they dip the potatoe before eating it. This solution they designate by an Irish term which signifies "blind herring." These, according to the theory, should be fat and not muscular, because they feed on carbonaceous food: but the facts prove the reverse, they are muscular but not fat; and if you require a proof, select one of those vegetable-eaters and start him on the mountain or on the plain against an individual who eschews potatoes, and lives almost exclusively upon bread and animal food, and you may rest assured, that the former will afford ample proofs that active and enduring sinews may be produced by unazotised aliment.*

* Azote and nitrogen are synonymous.

Experience at once points out, that although the proximate principles and ultimate elements of animal and vegetable food are so different, yet by the assimilating powers of the system, nutriment may be obtained from either, separately, but, perhaps, best from both conjointly.

We have before alluded to secretion as the deeply veiled offspring of life, but we are not desirous to hide our ignorance by referring the difficulty to the vital principle, which “does all sorts of work for all sorts of people.” Bostock judiciously says, in his chapter on secretions: “To suppose that we are affording any real explanation of the phenomenon, by ascribing it to the operation of the vital principle, or to any vital affinities, which is ‘merely a less simple mode of expressing the fact, is one of those delusive attempts to substitute words for ideas, which have so much tended to retard the progress of physiological science:’ and indeed he might have added, of science in general, the difficulties of which are not unfrequently enumbered by wordy stuff, which Mr. Burehell, in the Vicar of Wakefield, would call “*fudge*,” and which in Ireland we apostrophize by the classical term “*botheration*.”

Professor Liebig states in his “Organic Chemistry,” (p. 132,) “If the substances which do not contain nitrogen preponderate, either they will be expended in the formation of fat, or they will pass unchanged through the organism. This is particularly observed in those people who live almost exclusively upon potatoes.” He also adds: “Potatoes, which when mixed with hay alone, are scarcely capable of supporting the strength of a horse, form with bread and oats a strong and wholesome fodder.”

According to the theory of the German professor, Pat, that lives exclusively on potatoes and “blind herring,” should be one lump of fat: or be a living skeleton, having

neither fat nor lean. 'This may be the case with German digestive organs and German potatoes ; but Irish chylo-poietic organs and Irish potatoes are more compassionate. What an awful event it would be, if those obdurate German potatoes should be imported under the new tariff?—nothing could remain but a choice of evils ; our friend Pat *should*, from such aliment, put up fat—*all* fat—or “they will pass *unchanged* through the organism,” *i. e.* through and through Pat's body, “like the baseless fabric of a vision,” and leave not even “a wreck” (of nourishment) “behind.”*

Need I inform you that an Irish horse fed on “hay and potatoes,” would work the whole year round on such fodder, and if the dumb creature could speak, he would say it was excellent diet, even for a Lord Mayor's horse.

If man, as we have shown, and as several in Ireland will testify, can be supported upon potatoes as his *exclusive* diet, is not the following assertion of Liebeg very questionable ?

“A horse may be kept alive by feeding it with potatoes, which contain a very small quantity of nitrogen, but life thus supported is a gradual starvation ; the animal increases neither in size nor strength, and sinks under every exertion.” We happened very lately to have a large horse that lost condition sadly, although fully fed on hay and oats. Less of the latter combined with boiled potatoes were now given, and in a short time this horse was restored to condition, spirits, and *muscular* vigour. We would feel

* It would be curious to ascertain whether or not Mr. Bernard Cavanagh—the total abstinence man!!—was induced to try and live upon *nothing*, owing to his knowledge of the German discovery that “life supported by potatoes is a gradual starvation!!!” (p. 55.)

obliged to some of our country friends to put a horse upon potatoe diet *exclusively*, and report the result.

Well, in sober seriousness, we do agree with the illustrious Giessen professor, that the duty of the physiologist "is not to show that others are erroneous, but to discover truth, and that alone." Our opinion has been drawn from the observation of phenomena and from every day experience, both of which are directly opposed to Liebeg's conclusions. The following quotation from this admirable work furnishes us with a reply :

"Nature speaks to us in a peculiar language, in the language of phenomena ; she answers at all times the questions that are put to her ; and such questions are experiments. An experiment is the expression of a thought : we are near the truth when the phenomenon elicited by the experiment corresponds to the thought, while the opposite result shows that the question was falsely stated, and that the conception was erroneous." (p. 37.)

Dr. Coombe says, that in the United States of America an active and numerous sect has of late years sprung up under the auspices of Sylvester Graham, against the use of animal food in any form or quantity, and in favour of the exclusive use of vegetable aliment and water as the natural food of man.* He also states that the monks of

* "Dr. Aleot and others, of America, have published numerous examples of restored and improved health, arising from the exclusive use of vegetable food, when every other means had failed." This sect realise the picture drawn by Goldsmith's Hermit, of his dietary :

"No flocks that range the valley free,
To slaughter I condemn;
Taught by that power that pities me,
I learn to pity them.

But from the mountain's grassy side,
A guiltless feast I bring ;
A scrip with herbs and fruits supplied,
And water from the spring."

La Trappe make it part of their religion to eat only once a-day, and *nothing but vegetable food*, unless when sick, in which case milk is allowed.

Bostock states, that fat differs from albumen and fibrin in *not* containing nitrogen. Adelon and Adouin conceive that the principal use of the fat is to serve as a reservoir of nutritive matter, when the body is deprived of its regular supply by the ordinary channel. Beaumont says, that oily food contains "a large proportion of the nutritive principle." Paris, that "it has been calculated that an ounce of fat affords nutriment equal to four ounces of lean." Here then we have two aliments—fat and lean; although the former does not contain *any* portion of nitrogen, (azote,) and the latter *abounds* in nitrogen, yet the non-azotised aliment is *four* times as nutritive as the azotised.

We have dwelt longer than we had intended upon this portion of our subject, but we trust its importance will plead as a sufficient excuse. Prout observed, with the acumen of a sound philosopher, that milk being the only article furnished and intended by nature as food, the examination of its constituents might naturally lead to a knowledge of these proximate principles and ultimate elements which are essentially necessary for the nutrition of man. Those, as was before stated, (p. 92,) he found to be saccharine, oily, and curdy or albuminous matter. Does it not follow from the analysis, as nature is ever simple, that Prout is correct, when he states that "it is perhaps impossible to name a substance employed by the more perfect animals as food, which does not essentially constitute a natural compound of at least two, if not all three, of the above three great classes of alimentary matters?"

Instead of looking upon nitrogen as the essential element in nutritive substances, we should perhaps, from the analy-

sis of Prout, be led to consider carbon as better entitled to that pre-eminent position, (were it at all legitimate to fix upon any isolated element,) because the latter is found in *abundance* in *both* animal and vegetable substances, while vegetables contain but little nitrogen.

The following are the results of Prout's experiments (p. 93) in reference to carbon :

The characteristic property of saccharine bodies is, that they are composed simply of carbon, united to oxygen and hydrogen, in the proportion in which they form water ; the proportion of carbon varying in different instances from about thirty to fifty per cent. The other two families—oily and albuminous—consist of compound bases (of which carbon constitutes the chief element) likewise mixed with, and modified by water, and the proportion of carbon in oily bodies, which stand at the extreme of the scale in this respect, varies from about sixty to eighty per cent. Hence, considering carbon as indicating the degree of nutrition, which in some respects may be fairly done, the oils may be regarded in general as the most nutritious class of bodies. And the general conclusion from the whole is, that substances naturally containing less than thirty, or more than eighty per cent. of carbon, are not well, if at all, adapted for aliment.

We shall now proceed to make some additional observations upon animal and vegetable food, the dietetic qualities of which are mainly determinable by the proximate principles * just now referred to, and which we shall next proceed to examine.

* Dr. Paris distributes the *nutrientia* into the following nine classes :—

Cl. I. *Fibrinous aliments*. Comprehending the flesh and blood of various animals, especially such as have arrived at puberty: venison, beef, mutton, hare.

1. *Fibrinous aliments* are so named from a fibrinous ingredient constituting their chief or preponderating proximate principle. The blood—as was before stated—(p. 121) is that wonderful fluid which, when sent to the different parts of the body, constitutes the material from which the specific product is elaborated by the respective organs. Now, this substance called the coagulable lymph, gluten, fibre of the blood, and fibrin exists ready formed as the coagulable part of the blood; the clot of the latter being fibrin united with the colouring matter from which, by washing, it may be freed. “When the fibrin is thus procured in a pure state, it is found to be a solid of considerable consistence, elastic and tenacious, and in its general aspect, as well as its chemical relations, very similar to the pure muscular fibre,” or flesh of animals, which abounds in nitrogen and constitutes the most nutritive and stimulating of alimentary substances.

When muscular fibre (beef or mutton) has been macerated in water for some time it is reduced to a pure state, and is then nearly white, without much taste or smell, and

Cl. II. *Albuminous*. Eggs; certain animal matter.

Cl. III. *Gelatinous aliments*. The flesh of young animals: veal, chickens, calf's foot, certain fishes.

Cl. IV. *Fatty and oily aliments*. Animal fats, oils, and butter; cocoa, &c.; ducks, pork, geese, eels, &c.

Cl. V. *Caseous aliments*. The different kinds of milk, cheese, &c.

Cl. VI. *Farinaceous aliments*. Wheat, barley, oats, rice, rye, potatoe, sago, arrow root, &c.

Cl. VII. *Mucilaginous aliments*. Carrots, turnips, asparagus, cabbage, &c.

Cl. VIII. *Sweet aliments*. The different kinds of sugar, figs, dates, &c.; carrots.

Cl. IX. *Acidulous aliments*. Oranges, apples, and other acescent fruits.

To this we may add **CONDIMENTS**; such as salt, the varieties of pepper, mustard, horse-radish, vinegar, &c.

if it be kept free from moisture, it will remain a long time without undergoing decomposition or experiencing any change. If the water which has been employed in the maceration, and which contains albumen, jelly, extract, and various salts, be evaporated to dryness, and then treated with alcohol, the extract alone is dissolved, and, by the evaporation of the alcohol, may be obtained in a pure state. This substance was discovered by Thonvenel; it has a brown colour, an acrid taste, and an aromatic odour, is soluble both in alcohol and in water, and would seem to be the ingredient which gives the specific flavour to the flesh of different animals, and especially to the part which forms the brown crust on roast meat. It is to this substance that Thenard has given the name of osmazome. (*Bostock.*)

We shall have, presently, occasion to show that this osmazome is a most important ingredient. We are all familiar with the aromatic odour of roast beef, and with the deeply brown gravy which flows from it, both of which are caused by this peculiar substance. Mutton, beef, venison, hare, goose, duck, &c. are examples of aliment in which fibrin and osmazome abound. It is plain that where we wish to employ a highly nutritive and stimulating regimen this is the form of food we should select.

Paris observes, "that the texture of animal food influences its digestibility, and the latter is mainly affected by the age, sex, habits, condition, diet, and description of death of the animal which furnishes it." He adds, "The mode of killing an animal has been considered from the remotest ages, as capable of affecting the quality of its meat. The flesh of hunted animals is characterised by peculiar tenderness. The same effect is produced by any lingering death. This fact probably explains the policy of those old municipal laws, which ordained that no butcher should offer or expose

any bull-beef for sale unless it had been previously baited ; and it is upon the same principle only, that the quality of pig's flesh could be improved by the horrid cruelty of whipping them to death, as said to be practised by the Germans. The action of vinegar administered to an animal some hours before killing it, is also known to be capable of rendering it less tough. It is a common practice in the country, to give a spoonful of this acid to poultry when they are intended for the immediate service of the table." 'The observations of Philip, as agreeing with the results of Beaumont's experiments, have been already detailed at page 199.

2. *Albuminous aliments.* White of egg is the most simple and familiar example we can cite of albumen. This form of aliment is nutritive without being stimulating, and hence, is very suitable for convalescents. We find associated in ordinary animal food, fibrin, albumen, and gelatine. The fibrin and albumen are observed to preponderate in the older animal, the gelatine in the younger. Hatchell performed an experiment to illustrate the difference between the chemical constitution of albumen and jelly. "He found that if coagulated albumen be immersed for some time in diluted nitric acid, at the temperature of the atmosphere, it is gradually converted into a substance resembling jelly." Bostock supposes that in this case the nitric acid parts with a portion of its oxygen to the albumen, and consequently that jelly is to be regarded as differing from albumen, in containing a greater proportion of oxygen; an opinion which is supported by the analysis of Gay-Lussac, and Thenard. Glue and white of egg are familiar examples of gelatine and albumen. The former abounds in the structure of the young, the latter in those of the old animal—hence, we employ calf's feet to make jelly. The first is rendered fluid by heat,

the second is solidified by the same agent, the removal of which will cause the gelatine (glue) to become solid; while no such effect will be produced upon the albumen, for the white of egg once rendered hard remains in that state. “Londe considers albuminous aliments, such as oysters, brains,* eggs, &c. very suitable when the stomach is irritable and during convalescence, when much nourishment is required. He thinks them well adapted for old men, females, and literary people.” Beaumont states, (see p. 100,) that calf’s feet jelly was digested in little more than half an hour, eggs, raw, two hours—hard-boiled or fried, three hours thirty minutes.

3. *Gelatinous aliments*, like albuminous, are nutritive without being stimulating; hence, they are in such common use, and when patients are convalescent chicken broth or calf’s feet jelly are, in ordinary, first directed on these occasions. The younger the animal the more this principle abounds. Although Beaumont’s experiments prove that calf’s feet jelly was digested in half an hour, yet, we are not to conclude that veal or lamb is so quickly chymified. As the rule, the fibrinous aliments are more readily digested than either the gelatinous or albuminous, but the latter are less stimulating. (p. 199.)

The following inferences are drawn by M. Edwards from the whole of his useful experiments, to ascertain the value of this form of aliment :

1. That gelatine alone is insufficient for alimentation.
2. That although insufficient, it is not unwholesome.
- 3.

* According to German principles, those that have not been blessed with much brains of their *own*, ought to live very much on the brains of *others*. Persons that eat pig’s marrow are said not to keep secrets. We suppose such as live on swinish brains must be confounded blabs and stupid grunTERS !!

That gelatine contributes to alimentation, and is sufficient to sustain it when it is mixed with a due proportion of other products, which would themselves prove insufficient if given alone. 4. That gelatine extracted from bones, being identical with that extracted from other parts: that bones being richer in gelatine than other tissues, and able to afford two-thirds of their weight of it; there is an incontestable advantage in making them serve for nutrition in the form of soup, jellies, paste, &c.; always however taking care to provide a proper admixture of the other principles in which the gelatine soup is defective. 5. That to render gelatine-soup equal in nutritive and digestible qualities to that prepared from meat alone, it is sufficient to *mix one-fourth of meat-soup with three-fourths of gelatine-soup*, and that in fact no difference is preceptible between soup thus prepared and that made solely from meat. 6. That in preparing soup in this way, the great advantage remains, that, while the soup itself is equally nourishing as meat-soup, three-fourths of the meat which would be required for the latter, by the common process of making soup, are saved and made useful in another way, as by roasting, &c. 7. That jellies ought always be associated with some other principles to render them both nutritive and digestible."

Sheep's head broth is a popular and efficacious remedy for bowel complaints. The bones of the head should be broken into small pieces, which causes them to yield the gelatine more readily to the boiling water.

Under the class of gelatinous aliments, we have to refer to *fish*;* we before stated (p. 197) that this form of aliment

* After stating that milk consists of an emulsion of albumen, oil, and sugar suspended in a large quantity of water, and that the eggs of birds, which likewise contain a peculiarly nutritive species of food, consist chiefly of albumen with a quantity of oily matter; Bostock

does not afford as eligible nourishment as flesh meat, unless for such as find the latter too stimulating for every-day use. The white kinds of fish, though not easily digested, are often selected for the convalescent, owing to their not tending to excite fever. They don't possess osmazome, that principle which gives the peculiar flavour and odour to roast meat. In the healthy and vigorous fishermen we find abundant proof, that fish and potatoes form excellent nutriment for those of *active* habits. When on the different temperaments, we shall have occasion to point out the diet most suitable for each; from what has been just observed, it is plain, that such as require a concentrated, highly nutritive, and stimulating regimen, that this form of food will not be eligible.

Dr. Paris states, "Turbot, cod, whiting, haddock, flounder, and sole are the least heating of the more nutritive species; and the flakiness of the fish and its opaque appearance after being cooked, may be considered as true indications of its goodness, for when the muscles remain semi-transparent and blueish after sufficient boiling, we may reject it as inferior in value, or not in season." Whiting, haddock, and cod are esteemed in the order of enumeration. The operation of *crimping* improves the flavour and digestibility of the fish, and also causes it to keep longer.

Turbot, sole, and salmon are very nutritive—the last, though most nutritive, is heating and oily—vinegar aids the digestion of fish best of all. Lobster sauce is an abomination for invalids at all times. Eels are still more oily than salmon, and hence very indigestible.

Shell-fish is, generally speaking, indigestible. Some

adds, "Fish consist of a much greater proportion of albuminous and gelatinous matter, in some cases united with a considerable quantity of oil, and the same would appear to be the case with the testacea and the crustacea that are employed in diet." (See also p. 142 of P. Phy.)

species of it, as well as salmon, are prone to produce cataneous affections—giving another proof of the sympathy which exists between the stomach and skin, and a useful warning to those disposed to eruptive complaints, to avoid fish as a constant article of diet. Paris recommends boiling as the process best adapted to render fish wholesome—he also states, that potatoes and parsnips are the only vegetables that should accompany a meal of any species of fish; and that the invalid should abstain, upon all such occasions, from fruit. It is a well known circumstance that milk should be also interdicted.

4. *Fatty and oily aliments.*—These substances afford a great deal of nourishment; fat meat being esteemed four times as nutritive as lean; but it requires considerable digestive effort for its chymification. Dr. Beaumont states, “That oily food is difficult of digestion, though it contains a large proportion of the nutrient principle.” (p. 77.) It is perhaps, owing to this latter property, that fat pork and bacon are so much prized by the working classes. In England, beans and bacon are highly esteemed by labourers; the latter even in a *raw* state. Geese and ducks are well known to be an oppressive kind of poultry, owing to the quantity of fat mixed with the meat. (p. 192—199.)

5. *Caseous aliments.*—The different kinds of milk (p. 94—142) and cheese belong to this class. There is a strange and popular error on the subject of cheese. It is supposed—why I cannot learn—that it promotes digestion; “the more mouldy the better.” It may be owing, perhaps, to the notion, ignorantly entertained, of helping *putrefaction*,* which was at one time supposed to be identical with digestion.

Dr. Paris says, “Cheese, which is nothing more than

* The gastric juice suspends the putrefactive process—see p. 83.

the coagulum (curd) of milk, pressed, salted, and partly dried with a portion of butter, which, having been enveloped in the curd, is not afterwards separable, is one of the least digestible of our aliments, and is only adapted to strong stomachs, and to such persons as use great and constant exercise. When *toasted*,* it is still more injurious, from acquiring a tenacity of texture highly hostile to the digestive function of the stomach.”†

LECTURE X.

The alimentary products of the *vegetable kingdom*, have been ranked under the following heads : fruits, seeds, roots, tubers, seed-vessels, stalks, and leaves ; which owe their nutritive qualities to the presence of what we called (p. 95) *proximate* or *immediate principles*, the most important of which are gluten, farina, (starch,) gum, oil, and sugar.

Gluten and starch may be separated from the dough of wheaten flour inclosed in a piece of linen, by letting a small current of water fall upon the dough, and subjecting it at the same time to pressure between the fingers, until the liquid passes off quite clear. The gluten of the flour is left in a pure state, the saccharine and mucilaginous matters are dissolved, and the starch is washed away mechanically, being deposited from the water, on standing, in the form of a white powder. Very pure starch may be procured in a similar manner from the potatoe. It is remarkable that the process which the flour undergoes to free it from the parts combined with the *gluten*, is similar to that which the blood

* This is what has been named Welsh rabbit.

† Philip says, “ Cheese is in general still more difficult of digestion than either butter or fat. With their oily nature it combines the hardness and toughness of the dry and compressed curd, which is very difficult of minute division.”

is subjected to in order to procure the *fibrin* pure. These substances—the representatives of the most nutritive parts of each kingdom—are very analogous to each other.

The following concise account of the proximate principles of vegetables, is given by Dr. Bostock :*

Gluten has been the best adapted for the purposes of nutrition of any of the vegetable principles, both in consequence of its being of easy digestion, and of its containing, in proportion to its bulk, the greatest quantity of nutriment. This circumstance depends upon its being the substance, the elements of which the most nearly resemble those of the animal kingdom, hence the most animalized of any of the vegetable principles, and this chiefly in consequence of the large quantity of nitrogen which it contains. It exists in the greatest proportion in wheat, while it is found in small quantity only in the other kinds of seeds, or in the parts of plants generally. Next to gluten, in point of importance as an article of nutrition, comes the *farina* ; (starch ;) this is also found copiously in wheat and the other grains, and it likewise forms a considerable proportion of the nutritive parts of the various kinds of pulse and of tubers. The nutrition of leaves, stalks, and of seed-vessels, and the green parts of plants, resides in the *mucilage* (gum) which they contain, although, in most cases, this is united with a portion of saccharine matter, which naturally contributes to their nutritive powers. Most fruits contain a basis of mucilage or *farina*, which is combined either with sugar or with oil. In the pulpy fruits, with the exception of the olive, the former chiefly prevails ; they generally also contain a quantity of *acid*, in addition to their other ingredients, but it may be doubted whether the acid serves directly for the purposes of nutrition, or whether it should not be ra-

* The four last classes of Paris are here briefly described.

ther considered as indirectly promoting digestion, by its effect upon the stomach or the palate. The principal ingredients of the chestnut, which, in many countries, composes a large share of the diet of the inhabitants, are farina and sugar, while many of the nuts are composed of a basis of albumen, united to a quantity of sugar and oil. *Sugar* enters into the composition of many vegetable substances that are employed in diet, and although it is generally regarded rather as a condiment, than as a direct source of nourishment, yet it has been supposed to be the most nutritive of all the vegetable principles. Nearly the whole of the sugar that is consumed in Europe is produced from the sugar-cane, the juice of which contains it in large quantity and in a state of comparative purity. Sugar is also procured from the root of the beet in considerable quantity, and in some parts of America from the sugar-maple. *Oil*, either animal or vegetable, is commonly employed, more or less, in diet, and is likewise conceived to be highly nutritive: in the warmer climates vegetable oil is principally used, whereas in the colder regions animal oil is employed, as procured from milk in the form of butter.

The potatoe is reduced to the rank of farinaceous aliments. From its general use as an article of diet, the following account of this substance will doubtless be received with interest:

Dr. Paris in *Pharmacologia*, p. 44—45, after his eloquent description of tobacco, says, “The history of the potatoe is perhaps not less extraordinary, and is strikingly illustrative of the omnipotent influence of authority. The introduction of this valuable plant received, for more than two centuries, an unexampled opposition from vulgar prejudice, which all the philosophy of the age could not dissipate, until Louis the Fifteenth wore a bunch of the flowers of the potatoe in the midst of his court on a day of

festivity; the people then, for the first time, obsequiously acknowledged its utility, and ventured to express their astonishment at the apathy which had so long prevailed with regard to its general cultivation."

That which authority thus established, time and experience have fully ratified, and scientific research has extended the numerous resources which this plant is so wonderfully calculated to furnish: thus its stalk, considered as a textile plant, produces in Austria a cottony flax—in Sweden, sugar is extracted from its root—by combustion its different parts yield a very considerable quantity of potass—its apples, when ripe, ferment and yield vinegar by exposure, or spirits by distillation—its tubercles made into a pulp, are a substitute for soap in bleaching—cooked by steam, the potatoe is the most wholesome and nutritious, and at the same time the most economical of all vegetable aliments. By different manipulations it furnishes two kinds of flour, a gruel and a parenchyma, which in times of scarcity may be made into bread, or applied to increase the bulk of bread made from grain—to the invalid it furnishes both aliment and medicine: its starch is not in the least inferior to the Indian arrow root; and Dr. Latham has shown, "That an extract may be prepared from its leaves and flowers which possesses properties as an anodyne remedy." Excellent cheese has been also obtained from this valuable plant.*

Dr. Paris in alluding to the potatoe as the most economical of vegetable aliments; says, "What other discovery or invention ever produced such political consequences as the introduction of the potatoe as an article of food? From its operation as the main constituent of national sustenance, the population of Ireland has advanced from little more

* It may be truly said to combine in itself all the elements of "meat, drink, and clothing."

that one million to near seven millions within the last century and a-half!"

The mealy potatoe is the best, when new or young they are soft, these and the waxy kind are indigestible.

The result of Dr. Beaumont's experiments coincide with our ordinary observation. He found that potatoes roasted, took two hours thirty minutes—boiled, three hours thirty minutes for their chymification. It is remarkable that invalids will be able to digest this vegetable if cooked in the former way only—probably this mode of dressing renders them mealy, or less of the character commonly called "*wet*."

The following practical hint should not be lost upon those who consume this valuable species of aliment :

"*Steaming Potatoes*.—The secret of 'steaming' potatoes is very little understood, and rarely carried into full effect, although it is indispensable to the nutritious development of the vegetable. The whole mystery consists in suffering the steam to escape, and at the same time keeping the potatoes hot. When the cook throws off the water, under the jurisdiction of the cookery book, what is she to do next? The steam rushes out, and she places the vessel opposite the fire; but, fearful that the potatoes may cool in the meanwhile, she puts on the cover. Thus she undoes one process by the other, for the steam no sooner escapes from the potatoes than, being confined by the lid, it condenses rapidly, and falls back in water upon the vegetables. And thus, through the ignorance and obstinacy of our cooks, we are perpetually served with what are familiarly called wet potatoes—a sort of vague excuse which helps to throw the fault against the season or the gardener, or anything or anybody rather than the real culprit. The Irish peasant woman, wholly ignorant of science, but with

instinctive sagacity, gets rid of the difficulty by the simplest process imaginable. Placing the vessel without the cover in a slanting direction opposite the fire, so as to hasten the process of steaming by the external heat, she throws a napkin over the potatoes, which receives and retains so much of the steam as does not make its escape, while it performs the equally essential office of preserving the heat of the vegetable below."

When potatoes are boiled—the usual mode of dressing in Ireland—it should be recollected, that they are deprived of their nutritious qualities by over-boiling. The peasantry are well aware of this; and, say, that they are "strongest" when the "bone" is left in them, *i. e.* hard-boiled. In this condition they require the powerful digestion of the labourer. Philip says, "That fresh vegetables, on account of their tendency to ferment, are, on the whole, injurious in digestion. Some vegetables, however, are less so than others. Peas, beans, cabbage, and waxy potatoes he has found the worst. Mealy potatoes, turnips, and brocoli are among the best. They should always be boiled till they are soft. Raw vegetables of all kind are oppressive; lettuce appears to be the least so. The tough, thready, and fibrinous parts of vegetables are of most difficult digestion."

In Dr. Kitchener's Cook's Oracle, you will find no less than sixteen ways for dressing potatoes. He approves strongly of the plan already mentioned, and says, "That if you let the potatoes remain in the water a moment after they are done enough, they will become waxy and watery; after pouring off the water, he recommends what is commonly practised in Ireland, that the saucepan containing the potatoes shall be uncovered and set at such a distance from the fire as will secure it from burning, their super-

fluorous moisture will evaporate, and the potatoes will be perfectly dry and mealy. You may afterwards place a napkin, folded up to the size of the saucepan's diameter, over the potatoes, to keep them hot and mealy till wanted.

Sir J. Sinclair says, "That next to bread there is no vegetable article, the preparation of which as food, deserves to be more attended to, than the potatoe."—(*Code of Health.*)

It is a common error to conceive that potatoes are rendered more digestible by being finely mashed. Philip justly adds, "The coarser division which our food undergoes in mastication is better suited to assist digestion. Most dyspeptics find, that potatoes, for example, finely mashed, although without any admixture, are more difficult of digestion than when properly masticated. During mastication the saliva is freely mixed with them, and a loose mass is formed. When they are mashed they resist admixture with the saliva, as well as the gastric fluid."

Potatoes, in all forms, frequently disagree with the dyspeptic—the addition of salt and pepper will often enable the invalid to eat one or two without suffering from distressing flatulency, which they so commonly produce in these habits. *Rice* may often be substituted, with advantage, in such cases; but its insipidity will call for the addition of some seasoning; indeed most of those farinaceous substances require either condiment or wine to induce the invalid to eat them. How often is it asked, "May I have some wine in the *sago*, *tapioca*, or *arrow root*?"* *Nuts* belong to the farinaceous class of aliments; "they are oily, viscid, and glutenous;" and Dr. Paris adds, "When eaten they should always be accompanied with salt; but it would be wise

* According to Dr. Beaumont's experiments upon St. Martin, rice boiled soft was perfectly converted into chyme in an hour; sago, in one hour forty-five minutes; tapioca, barley, &c., two hours.

to banish them entirely from our tables." The fits of indigestion that occur after All Hallowed-eve, when so much nuts and apples are consumed, are not unjustly attributed to this, as the cause. Hoffman observed, "That dysenteric complaints are always more common in those years in which the harvest of nuts is plentiful."

The distension produced by the bulk of the vegetables, &c. included under the 7th, 8th, and 9th classes of Paris' arrangement, both immediately by the mass of these substances, and remotely by the fermentation commonly caused by such mucilaginous, saccharine, and acidulous aliments, renders them in general ineligible food for dyspeptics. In despite of all this, we will often find that what we have already observed (p. 164) holds good in reference to the vegetable kingdom; namely, that although certain aliments are to be esteemed unwholesome, or in ordinary difficult of digestion, yet, if they are eaten with a decided liking or "relish," it is surprising how rarely they disagree with the stomach. We have frequently alluded to the powerful and enduring efforts made by the Irish peasantry, many of whom are supported almost exclusively upon potatoes. It is a curious fact, that certain vegetable aliments are found to be digested in the *intestinal* canal, and it is a matter of familiar observation, both in man and brutes, that some substances of this class, if not sufficiently bruised or divided, pass off without being deprived of their nutritive properties. It is a strange circumstance, and quite at variance with our usual experience, that, according to Dr. Beaumont's experiments, *raw* cabbage was digested in two hours thirty minutes—boiled, four hours; vinegar much assisted its digestion. The following observations, by Dr. Paris, on esculent herbs and roots, agree so entirely with our own observations, and the results of Dr. Beaumont's experiments upon St. Martin, that we shall quote them in his own words :

" ESCULENT ROOTS.

These are of two kinds, those used as food, and those which principally answer the purposes of condiments or seasoning. Under the first division may be classed turnips, carrots, parsnips, Jerusalem artichokes, radishes, &c., many of which, it will be seen, are seldom used solely for aliment, but are rather brought to our tables to qualify our animal food. Under the second division may be arranged onions, garlic, horse radish, &c. It will be necessary to offer a few observations upon the qualities of these several roots. The *carrot*, from the quantity of saccharine matter which it contains, is very nutritive, and slightly laxative; but it also possesses a large proportion of fibrous matter, which in some stomachs prevents the digestion of the root, and it passes through the bowels with but little change; to obviate this effect, it ought to be very thoroughly boiled, and should be eaten when young. It appears to have been introduced by the Flemings, in the reign of Elizabeth. The *turnip* is a very excellent vegetable, and, although it has the character of being flatulent, is less liable to disagree with the stomach than the carrot; it ought however, to be well boiled and the watery part separated by pressure. Lord Townshend, Secretary to Charles I., was the person who introduced its use into England, but it appears that the ancient Romans, in the best period of their republic, lived much upon this root. The *parsnip* is nutritive and digestible, although many persons dislike it on account of its sweet flavour. The *Jerusalem artichoke* is agreeable, but watery and flatulent, it ought therefore, never be eaten without a proper accompaniment of salt and pepper. *Radishes*, all the varieties of which have a pungent and acrid taste, in consequence of a peculiar stimulating matter, which resides in the cortical part of the root. They may be said to contain little else than water, woody fibre, and acrid matter, and cannot therefore be very nutritive; they may act as a stimulant and thus prove useful, but they ought never to be eaten when old, as the quantity of

inert matter, in such a condition, is apt to disagree with the stomach. From the consideration of radishes we pass, by an easy transition, to that of *onions*, &c., for they appear to form the connecting link between alimentary roots and those used principally as condiment. The onion, however, although classed under this latter division, and must be considered as valuable on account of its stimulating matter, certainly contains a considerable proportion of nourishment. This appears evident in its boiled state, by which process its acrimony is exhaled, and a sweet mucilage separated. Sir John Sinclair says, 'that it is a well known fact, that a Highlander, with a few raw onions in his pocket, and a crust of bread or some oat-cake, can travel to an incredible extent, for two or three days together, without any other sort of food.' The French are fully aware of the quantity of nourishment this plant affords; hence the soup *à l'oignon* is considered by them as the best of all restoratives. As a stimulant to the stomach and bowels, the onion, in a raw state, is certainly of value, and this is much enhanced by its diuretic qualities. The leek, garlick, shallot, are of the same species, and possess qualities of the same nature. *Horse-radish* is a warm and pungent root, and is highly valuable to the dyspeptic; as a stimulant it is, perhaps, the best of all condiments for the prevention of flatulence."

"ESCULENT HERBS.

Some herbs are still eaten in a raw state; but they are far less digestible than when cooked. During the heats of summer they are refreshing, and are well calculated to assuage that febrile state which full meals of animal food are known to occasion. Of all these herbs, the water-cress is the most beneficial, for, by operating in some degree as an aromatic, it promotes digestion, and corrects that tendency to flatulency which other raw vegetables are apt to produce. According to Xenophon, the ancient Persians lived upon water-cresses, which they considered the most wholesome of vegetable productions. The

lettuce is generally eaten with other herbs, in the form of a salad dressed with oil and vinegar. Some difference of opinion has arisen with respect to the propriety of such additions. Gosse, of Geneva, found that vinegar retarded its solution in the stomach: and oil has been stated by others to render it less digestible. I have generally found such condiments useful, and that dressed lettuce is less likely to ferment in the stomach than that which is eaten without them. Oil is known to have such an effect in checking fermentation, and the vinegar is not found to promote it. The lettuce contains a narcotic principle, and the effect of this is, in a great measure, obviated by the vegetable acid. Those persons therefore, who eat lettuce with a view to obtain such effects, ought to take it without vinegar. Whatever difference of opinion may exist with regard to lettuce, there is none with regard to celery, the digestibility of which is greatly increased by maceration in vinegar. Cucumbers are by far the most unwholesome of all raw vegetables, and should be avoided as poison by dyspeptics.

The vegetables which require to be boiled are the different species and varieties of colewort; the value of which does not depend so much upon their nutritive quality as the tenderness of their texture. On this account the cauliflower and brocoli are the species to be preferred, particularly the younger sprigs of the former. Of the kinds where the leaves only are employed, the savoy is of a sweeter and more tender texture than the others, particularly its central and upper leaves. The cabbage tribe appear to contain a peculiar essential oil, whence the unpleasant odour of cabbage water, this matter is liable to produce offensive effects on the stomach; the vegetable should therefore be boiled in two successive waters, in order to free it entirely from the noxious ingredient, and at the same time to render its texture soft and digestible. Asparagus is quickly dissolved in the stomach, and when sufficiently boiled, is not disposed to create flatulence or acidity: along with its mucilage it frequently contains some sweetness, which affords proof of its nutritive quality. Aspa-

ragus is only wholesome when in an intermediate state, between root and plant, when older than this it is remarkably acrid."

Paris's experiments have led to the conclusion, that this vegetable does not possess diuretic properties.

With reference to *fruits*,* we have to remark that, generally speaking, they are to be esteemed by the valetudinarian, as difficult of digestion. We are not, however, to interdict them altogether, for some species, particularly during a warm season, prove grateful, refreshing, and wholesome; and indeed the fact of their being so abundantly supplied by nature at this period, joined with the instinctive desire we have for them, would argue strongly in favour of their use. We will generally find that the derangement produced is caused by an injudicious selection of fruit—an excess in its quantity, and the fact of it being eaten at an improper time. Melon and stone fruits, with the exception of the ripe peach, are to be esteemed indigestible—melon and all the cold fruits, cucumbers, &c., particularly so—if the dyspeptic *will* eat the former, the horrible and dangerous act should be perpetrated with a plentiful supply of pepper and salt. Apples and pears are less prone to fermentation than most fruits: those that are disposed to torpid bowels will often be benefited by the last mentioned. Strawberries, raspberries, gooseberries, and grapes will be found, if eaten in moderation, and when perfectly ripe, cooling, digestible, and aperient. The husks, seeds, and skins of all fruits should be carefully avoided. Black currants are considered very wholesome. Oranges are general favourites, and, when ripe, may be

* "Different parts of the same fruit have frequently very different properties. The lemon offers a good example of this fact, for its juice is *acid*, its seeds *bitter*, and its peel *aromatic*."—*Paris*.

freely used—the pulp should not be swallowed—the juice of this fruit and water make a grateful drink. Apples sliced and boiled in water also make an agreeable beverage. An observation we have often made in reference to articles of diet, is peculiarly applicable in relation to fruits, “if eaten with a decided liking it is surprising how rarely they disagree with the stomach.” Aesculent fruits are most prone to interfere with digestion. The different forms of jams, jellies, &c. are very indigestible, owing to the large quantity (equal parts) of sugar added to the fruit to preserve it. It is fortunate that we are not often required to request children to eat little (*jam satis*) of these preserves, for they generally associate the latter with physic and hence are inclined to “throw both to the dogs.” Dried fruits are also open to objections for the same reasons that jams and jellies are interdicted. We have somewhere heard it, as an “old say,” that “fruit was as gold in the morning; as silver at noon; and as brass in the evening.” Paris says, “The most proper period for indulgence in fruit appears to be in the morning and evening. On some occasions it may be taken with advantage at breakfast, or three hours before dinner, and it affords a light and agreeable repast if taken an hour before bed-time; but,” he judiciously adds, “these regulations are to be influenced by circumstances which no general rule can possibly embrace.” It is therefore so necessary that the close and accurate observation of the valetudinarian shall constantly be directed to time, quality, and quantity, as the grand tripod upon which dietetics rest.

Condiments.—We have in Lecture IV. (p. 101) already spoken of these substances; we then stated that they were injurious on two accounts, by pleasing the palate at the expense of the stomach, thus inducing us to eat too much: and

secondly by injuriously stimulating this organ, they produce a corresponding collapse afterwards. *Vinegar* appears, according to the experiments of Beaumont, to assist the digestion of vegetable aliment. (p. 99.) The digestion of rich soups, fat and luscious meats, is aided by the addition of this condiment, lemon juice, &c. We have seen very injurious consequences result in several cases where vinegar had been perseveringly taken in considerable quantity in order to make the individuals "thin and genteel," and remove "a vulgarly high complexion."* Paris states, "That it has been well said that the best quality of spices is to stimulate the appetite, and their worst to destroy, by insensible degrees, the tone of the stomach." It is but a bad excuse for their use to say, that they are necessary to enable us to chymify indigestible substances.†

Drinks include not only such fluids as are taken in ordinary to satisfy thirst, but also all those liquids, nutritive or stimulating, which contain considerable portions of aliment or alcohol. At pages 51—54, we have already considered the subject of thirst. We shall now, therefore, confine our observations to a brief description of the properties, &c. of those fluids in ordinary use.‡

Water, being the natural beverage of man, should be first considered. It is plain, that the qualities of this important fluid will be greatly influenced by the quarter from which it comes, the substances that may be combined with

* A lady who now pleads guilty to 40, told me that when a girl, she used to drink quarts of vinegar, with this purpose in view.

† A patient said to Abernethy, "I get a pain when I do that," and at the same time raised his arm. The Doctor laconically replied, Well, don't do that! *Mutato nomine*, we say, don't eat indigestible substances.

‡ A short account of tea, coffee, chocolate, cocoa, milk, whey, barley-water, gruel, &c. will be found from p. 133 to 151.

it, the way in which it is conducted, and the kind of reservoir in which it is kept. Like the atmosphere in the country and in the city, we find that equal measures of water, pure or impure, contain the same proportions of oxygen and hydrogen, considered in relation to their ultimate elements only. The substances superadded to air on the one hand, and to water on the other, produce those important differences which influence, more or less, the salubrity of these elements. We shall in the first place speak briefly of the different varieties of water in ordinary use. *River water* is that which, in great cities, is chiefly used, conveyed, as we find in Dublin, by canals to two large basons at the north and south sides of the city. This kind of water is, of course, obtained from a number of tributary springs and rivulets in the course of the canal or river, and the commingled rain. 'Tis a *soft* water, suitable for all domestic purposes. River water is, in the country, generally very pure, less so in the neighbourhood of large towns for obvious reasons. We have good grounds to congratulate the citizens of Dublin upon the admirable arrangements adopted, by which they are insured a supply of perfectly pure water by canals, spacious basons, and metal mains. Thus the country becomes as it were a heart to the city, sending by the canals, as by two arterial trunks, the pure vital fluid, to be circulated through the remotest ramifications of Dublin, while the river Liffey, running from west to east, carries off, like a great Cloacæ or main sewer, all the filth, &c. of the city, to be finally "in the deep bosom of the ocean buried."

Rain water.—Paris states that this is the purest natural water, being produced as it were by a natural distillation. That collected near large towns derives some impregnation from the smoky and contaminated atmosphere through

which it falls : and if allowed to come in contact with the houses will be found to contain calcareous matter, in which case it ought never to be used without being previously boiled and strained. Hippocrates gave this advice : and M. Magraaf, of Berlin, has shown the wisdom of the precaution, by a satisfactory series of experiments.*

Leibeg † has proved that ammonia hartshorn (a combination of hydrogen and *nitrogen*) is present in rain water. It will be remembered that this—ammonia—is considered a most essential ingredient in manure. (p. 262.) The simplest test that he gives for its presence is, “ the addition of a little powdered lime, which separates the ammonia, and thus renders its peculiar pungent smell sensible.” The learned professor adds, “ The sensation which is perceived upon moistening the hand with rain water, so different from that produced by pure distilled water, and to which the term *softness* is vulgarly applied, is also due to the carbonate of ammonia contained in the former.” How admirably does his explanation of the source of ammonia prove the beautiful simplicity of the means by which nature works her wondrous ways ; the elements produced by death and decomposition becoming ultimately subservient to the support of vegetable and animal life.‡

* See Note p. 25, for the method of removing the insipidity of boiled water.

† “ *Organic Chemistry in its application to Agriculture and Physiology.*” 1841.

‡ Leibeg says, (p. 73,) “ A generation of a thousand million of men is renewed every thirty years : thousands of millions of animals cease to live and are re-produced in a much shorter period. Where is the nitrogen which they contained during life ? There is no question which can be answered with more positive certainty. All animal bodies, during their decay, yield the nitrogen in the form of ammonia.” Again he adds, “ The nitrogen of putrified animals is contained in the atmosphere as ammonia, in the form of a gas which is capable of entering

Spring and *well** *water* are pretty nearly the same. If they dissolve soap they are called *soft*: if not, *hard* water. The former should be preferred. "Sulphate of lime in the proportion of five grains to the pint will constitute *hardness* unfit for washing with soap, and for many other purposes of domestic use." *Snow* water is not unwholesome. *Lake* and *marsh* water, from being stagnant and usually the depository of decomposing animal and vegetable matter, is the most impure of all water. Considerable mischief has arisen from conveying water by leaden pipes and keeping it in vessels lined with this metal. The acidity of foul water produces this bad consequence.

The impurities of water may be removed by filtration through alternate layers of sand and charcoal, which is the best mode of abstracting animal or vegetable matter. Boiling should not be omitted. "The *hardness* of water will generally be removed when it depends on *sulphate* of

into combination with carbonic acid, and of forming a volatile salt. Ammonia in its gaseous form, as well as its volatile compounds, are of extreme solubility in water. Ammonia therefore, cannot remain long in the atmosphere, as every shower of rain must condense it, and convey it to the surface of the earth. Hence also rain water must, at all times, contain ammonia, though not in equal quantity. It must be greater in summer than in spring or winter, because the intervals between the showers are in summer greater; and when several wet days occur, the rain of the first must contain more of it than the second. The rain of a thunder storm, after a long protracted drought, ought, for this reason, to contain the greatest quantity which is conveyed to the earth at one time." Ammonia has been detected in snow water. The fertilising effects of snow may be, perhaps, attributed to this circumstance.

* A pupil of mine mentioned that he had lived where there were three excellent wells; and that having been seized with a severe fever, he drank alternately and exclusively, the waters of these springs. His sense of taste had been so accurate, that he could discriminate with certainty, between the three different waters, and name them accordingly.

lime, by the addition of from ten to fifteen grains of an alkaline carbonate (soda) to every pint twenty-four hours before it is used. If it should depend upon *super-carbonate of lime*, long boiling, without any addition, will be found sufficient for its cure."

Fermented and Distilled Liquors.—All things in life have been reduced to one or other of the three classes, good, bad, or indifferent. These epithets may be affixed to the fermented or distilled liquors in a dietetic point of view, according as we come to consider them in relation to the different classes of valetudinarians. Paris says, "That there is a great fallacy in reasoning against the *use* of a custom from its *abuse*;" and adds, "There exists no evidence to prove that a temperate use of good wine, when taken at seasonable hours, has ever proved injurious to healthy adults. In youth, and still more in infancy,* the stimulus which it imparts to the stomach is undoubtedly injurious; but there are exceptions even to this general rule. The occasional use of *diluted*† wine has improved the health of a child by imparting vigour to a torpid stomach: we ought, however, to consider it rather as a medicine than a luxury." We should mention now that wines, malt drink, whiskey, &c. owe their stimulating property to the

* An ingenious Surgeon tried the following experiment:—He gave to two of his children, for a week alternately, after dinner, to the one a full glass of Sherry, and to the other a large China orange. The effects that followed were sufficient to prove the injurious tendency of vinous liquors. In one the pulse was quickened, the heat increased, the secretions morbidly altered: *diminished flow of bile*. Whilst the other had every appearance that indicated high health. The same effects followed when the experiment was reversed.—*Beddoe's Hygeia*.

† We have known some instances in which even claret could not be used in an undiluted form. The stimulus becomes less active, and the greater effect, with a less quantity of spirit, has been explained by the more general application of the stimulant to the stomach.

presence of a principle common to all, namely, alcohol or spirits. When we speak of alcoholic liquors we necessarily include amongst them all the beverages above mentioned. Philip, after observing how injurious to the digestive organs and to the system generally these stimulants are, when taken in considerable quantity, says, "Like most substances capable of powerfully affecting the animal frame, they possess valuable as well as pernicious qualities; and, even were the former of these less eminent than they really are, so general is their use in one form or other; and in most people the habit which requires their continued use so fixed, that they seldom can be wholly withdrawn, except in very early life, without doing more harm than good." Paris' experience coincides with this view of the subject. The labours of Father Mathew have proved in Ireland that teetotalism may be adopted by even the most intemperate without leading to injurious effects by the sudden removal of the wonted stimulus which they had so much abused. The transition from intemperate habits to complete abstinence from all alcoholic beverages, was, in thousands of instances, immediate. Instead of producing the depression and collapse which one would suppose should immediately result under these circumstances, the reverse was the case. The improvement produced in the general health—the "mind, body, and estate"—of such individuals, was as rapid as the changes were remarkable. It is true, some required a *small* allowance of the usual alcoholic potation, but these were so few as to constitute but very unfrequent exceptions to the rule, and proceeded very often more from weakness of resolution than that of body. This exemption from bad consequences was found equally true in reference to all ages and sexes.

We fully coincide with the following opinion of Philip:

“All will agree that alcohol, in every shape, is unnecessary to those who are in health, and have never been accustomed to the use of it; and that had no beverage but water ever been known, however we might feel the want of a stimulus in many cases, doubtless the most valuable we possess, some of the most fatal diseases we are subject to would have been less frequent.”

We have already (see page 105 to 116) dwelt at some length upon the evils, physical and moral, that have resulted from the habitual use of alcoholic fluids: need we ask if the benefits and evils following from these beverages were weighed in the balance, which would preponderate?

Wine is generally understood to mean that beverage obtained from the fermented juice of the *grape*. Foreign wine contains tartaric acid; domestic wine malic acid; “hence, the great defect that is necessarily inherent in the wines of this country, and which leads them to partake of the properties of cider.”

We have already included wine amongst the beverages containing alcohol: it is owing to the greater or less quantity of this element that the different kinds owe their strength.* The wine is called *red* when coloured by the astringent matter derived from the husk of the grape. If the hulls and stalks be kept apart during the fermentation, *white* wine is in all cases produced.

* “Daily experience convinces us that the same quantity of alcohol applied to the stomach under the form of wine, and in a state of mixture with water, will produce very different effects upon the body, and to an extent which it is difficult to understand. It has been, for instance, demonstrated beyond the reach of doubt, that Port, Madeira, and Sherry contain from one-fourth to one-fifth their bulk of alcohol; so that a person who takes a bottle of either of them will thus take nearly half a pint of alcohol, or almost a pint of pure brandy.”—*Paris*.

Philip says, that the form in which alcohol is most beneficial and in general does least harm, is in that of foreign wines. He gives a preference to Port. Paris recommends white wine for the dyspeptic. The kind of wine—the quantity, diluted or not, must be determined in a great degree by the experience of the invalid himself. If acidity of the stomach—flushing—excitement—irritability (fidgets) followed by depression of spirits, supervene the use of wine, it should be changed, diminished, or wholly discontinued. We have before observed, in reference to diet, that each individual should be guided by what *he* finds to agree and disagree, as we cannot lay down a rule that will be equally applicable to all. The digestive, circulating, and nervous systems will not fail to afford those that will attend to them, admonitions of a useful kind which are sufficiently intelligible for all. In the gratification of the palate, we too often compromise the interests of the stomach. When we wish to give a wine less stimulating than Port, Sherry, or Madeira, we direct *Claret*, owing to its containing about one-third less of alcohol: when *genuine* it is considered the most salubrious of our wines, more especially in warm weather. *Champagne* and the sparkling effervescing wines, are said to owe their suddenly intoxicating influence to the combination of the alcohol with carbonic acid gas, and the former being thus applied to a very extended nervous surface. Diluted wine, in a given quantity, may, for a like reason, be more intoxicating than an equal portion of wine undiluted. The *domestic* wines cannot be recommended, owing to the great tendency they have to run into the acetous fermentation: this is accounted for, because they contain but a small quantity of spirits.

Malt drinks present us with examples of substances which, although very nutritive, are not in the same degree diges-

tible, although malt drink generally requires the powerful digestion earned by labour or active habits and out-of-door exercise; yet, we will often find that delicate, and even sedentary females, more especially when nursing, will improve in health and strength while taking XX porter* and ale: they often prove as sedative as an anodyne draught and tonic; this is said to be caused by the hop, which is well known to be narcotic as well as bitter.

Ardent Spirits.—There are some dyspeptics with whom all fermented liquors disagree in a marked manner, and with whom either habit or debility will render diluted alcohol indispensable. In such rare cases, “the mixture of spirits and water should be made twelve hours before it is used, as spirits and water do not easily combine.” The addition of lemon and sugar (punch) adds to the indigestibility of the compound, which is besides objectionable on the grounds of the high temperature at which it is drunk.

Having said as much respecting the articles of diet, &c.

* A gentleman informed me lately, that he was constantly plagued with indigestion until he hit on XX porter, a pint of which, taken in the morning early, produced all the good effects attributed to *Abernethy's* claret. The origin of the beer called *entire* is to be thus explained:—Before the year 1730, the malt liquors in general use in London were ale, beer, and two-penny; and it was customary to call for a pint or tankard of half and half, *i. e.* half of ale and half of beer, half of ale and half of two-penny. In course of time it also became the practice to call for a pint or tankard of *three-threads*, measuring a third of ale, beer, and two-penny; and thus the publican had to go to three casks, and turn three coeks for a pint of liquor. To avoid this inconvenience and waste, a brewer of the name of Harwood conceived the idea of making a liquor which should partake of the same united flavours of ale, beer, and two-penny. He did so and succeeded, calling it *entire*, or *entire butt*, meaning that it was drawn entirely from one cask or butt; and as it was a very hearty and nourishing liquor, and supposed to be very suitable for porters and other working people, it obtained the name of PORTER.—*Paris.*

in ordinary use, as our space and purpose will permit, we shall next beg to direct your attention to a no less important subject, namely,

4. *The Period of Meals.*—We have before stated what may be justly named an aphorism, in reference to man, both in a mental and physical point of view, “that he is the creature of habit.” There is no more decided truism than this; that definite periods should be fixed for the taking of food, for no sensation is more influenced by habit than that of appetite. The stomach, like all other agents, requires a proper period of repose after its labours; consequently, we should not oppress this important organ by over work, fallaciously influenced by our solicitude to nourish the system, or to gratify the palate at the expense of this patient sufferer. To eat when we are hungry, and drink when we are thirsty, would appear to be an excellent rule, as these sensations are the indications given of the respective wants of the system. We have shown (p. 48) that the valetudinarian is apt to confound morbid feelings with appetite, and will often say that he cannot determine whether he is very sick or very hungry; the influence of stimulants, wines, spices, &c., joined with inviting odours and flavours that so successfully appeal to our senses, often induce us to eat when appetite—true appetite—indicating the wants of the system—is not present.

We shall on this occasion confine our observations to the dyspeptic only. We have (p. 128) already made a division of the day—twenty-four hours—into three equal parts, as our plan; namely, eight hours for sleep, eight hours for employment, and the remaining eight for prayer, meals, exercise, enjoyments, &c. Now let not our valetudinarian start and exclaim, “I am not a man of business!!” “Most likely,” I would reply, “for if you were a man of business you

probably would not be so much of a dyspeptic." There is no better way of getting over the day, "killing time" as it is said, than by having something to do as a definite *indispensable* employment; the best banisher of *ennui*, the incubus* of both body and mind. Well, you are to rise at six o'clock, or say six in summer and seven in winter if you will, but, for uniformity sake, I would recommend six all the year round. We must admit that there are many—not exclusively invalids—that can never acquire the habit of early rising. How commonly we hear them say, "I am sick all day when I rise early—I'm good for nothing, can't read or work." Well I believe there is a peculiarity (idiosyncrasy) in this respect; when it is not attributable to habit or sheer indolence—the failing not the fault—why we must needs let these folk have their way. You'll generally find that such individuals are disposed to sit up to a late hour; while, *v. v.*, you'll find the early riser cannot read or occupy himself in comfort after nine or ten o'clock at night. As we are just now to consider sleep as a distinct subject, we shall, without further preface, proceed to the period of breakfast. We have considered this point before (p. 132) and said, that both the dyspeptic and those in robust health, are alike benefited by taking this repast, soon after rising; owing to the empty condition of the stomach and upper bowels then existing, the valetudinarian is peculiarly unfitted for any active exercise of either mind or body before breakfast. By the time the shower

* A literary friend—a book-worm—once observed to me, when attending him for aggravated dyspepsia, that he conceived independence and want of active employment were the root of his disease. "Had I been bred a carpenter," he added, "and obliged to earn my daily bread, I might now have been a healthy man."

bath—friction with horse hair gloves*—shaving and dressing for the day, &c. are all over, even the six o'clock riser will have approached very near to eight o'clock.

Some will tell you they cannot eat at that hour—well, they can drink, and so let them have then a cup of tea, coffee, cocoa, or any of the beverages we have already mentioned, (see lect. V.,) and postpone his breakfast to ten, eleven, or twelve, when appetite shall have arrived; he will at that time usually be able for substantial fare, often animal food will prove serviceable, more especially if the interval be spent in gentle exercise in the open air, such as walking or gardening. We have known some instances where the invalid possessed a good deal of vigour, and was of the *muscular* temperament, to admit of a long walk before breakfast, a crust of bread or a biseuit being the only thing taken at starting. We will find that such cases constitute the exception not the rule. Writers on the subject of dieteties have differed much as to the number of meals recommended during the day, varying from one to five.† According to our experience, three would appear to be the *best* number: it is a lucky number—as we say in Ireland—in harmony with the division we have made of the day; morning, noon, and night will also correspond to breakfast,

* An eminent divine mentioned, that ever since he had been in Germany, he spent an hour daily in rubbing his body with horse hair gloves, and that it proved to be the pleasantest period of the twenty-four hours.

† The best time for dining has been said to be, “for a rich man, when he can get an appetite, and for a poor one, when he can get food.” Celsus recommends the healthy to take food rather twice in the day than once; and Sanetorious says, “that the body becomes more heavy and uneasy after six pounds taken at one meal than after eight taken at three; and that he who takes but one meal in the day, let him eat much or little, is pursuing a system that must ultimately injure him.”—*Paris*.

dinner and supper. (tea.) The results of Beaumont's experiments upon St. Martin, induce him to conclude, "that the time required for digestion is various, depending upon the quantity and quality of the food, state of the stomach, &c.; but that the time ordinarily required for the disposal of a moderate meal of the fibrous parts of meat with bread, &c., is from three to three and a half hours." Now, as our dyspeptic should not be supposed to possess the digestion of the healthy St. Martin, let us take four hours or four and a half, as the average period required by the former; this would—supposing we say eight o'clock for breakfast and two for dinner—give from an hour and a half to two hours repose to the stomach after the digestion of the morning repast: in like manner, by fixing on eight o'clock for tea, we give a similar interval between the second and third meal.

As the habits of society and various contingent circumstances, often without the control of the valetudinarian, may prevent him from carrying the foregoing plan into effect, we give three plans, in which the intervals between the first and second differ from the third :

1. Breakfast, eight o'clock.
 Dinner, two o'clock, }
 Supper or tea, eight o'clock, } Interval
 From supper to breakfast, twelve hours. } six hours.
2. Breakfast, nine o'clock.
 Dinner, three o'clock, }
 Supper or tea, nine o'clock, } Interval
 From supper to breakfast, twelve hours. } six hours.
3. Breakfast, nine o'clock, }
 Luncheon, one o'clock, } Interval
 Dinner, five o'clock, }
 Supper or tea, nine o'clock, } four hours.
 From supper to breakfast, twelve hours. } four hours.

For those that possess a rapid digestion the last plan would be the best; less being taken at each meal it will be also applicable to those who have contracted the injurious habit of taking "little and often," conceiving that strength will be gained in proportion to the quantity of food delivered to the stomach. We will here repeat what was before mentioned: (p. 86 :) This is a remarkable and important fact, established by the experiments of Dr. Beaumont, that the quantity of gastric juice secreted bears relation, not to the mass of food received by the stomach, but to the quantity of aliment required by the system. Hence, if we should eat more than the wants of the body require, we are punished by indigestion supervening, owing to that portion of food which is in excess not being chymified. A clerical friend mentioned, that having on some days to discharge from twelve to thirteen hours of professional duty, he found that when he eat little he was equal to the labour, and that his powers of mind were much more vigorous than when he had eaten as much as appetite would indicate. He also informed me that the late Lord Drogheda was most abstemious, always rose from table with appetite. This nobleman lived to the advanced age of 99. The rule we would wish the valetudinarian to adopt is, that he should appease hunger *only*, but not *wholly* remove appetite. We cannot too often repeat the caution, not to gratify the palate at the expense of the stomach, therefore plain food is that which is least likely to overload* this organ.

* Paris has so judiciously alluded to the mischief arising from the too prevailing fashion of introducing at our meals an indefinite succession of incompatible dishes, that I shall introduce here his graphic sketch of a modern dinner amongst the higher classes of society in England. The habits of this rank in all countries are said greatly to approximate. "The stomach being distended with soup, the digestion of which from the very nature of the operations which are necessary

Sleep is well known to be as indispensable for us all as food. It is, peculiarly, the repose of the nervous system. During our waking moments, the relative functions are constantly exercised—the external senses by their respective nerves, convey the impressions made upon them to the brain or sensorium, the perception of which constitutes ideas, “immediate objects of the mind in thought.” Here the agent causing the impression, which subsequently produces the perception, acts primarily from without. The second chain of phenomena proceed in an opposite direction, commencing

for its completion would in itself be a sufficient labour for that organ, is next tempted with fish, rendered indigestible from its sauces; then with flesh and fowl; the vegetable world, as an intelligent reviewer has observed, is ransacked from the cryptogamia upwards; and to this miscellaneous aggregate are added the pernicious pastecios of the pastry cook and the complex combination of the confectioner. All those evils and many more have those who move in the ordinary society of the present day to contend with. It is not to one or to two good dishes, even abundantly indulged in, but to the overloading the stomach, that such strong objections are to be urged; nine persons in ten eat as much soup and fish as would amply suffice for a meal, and as far as soup and fish are concerned would rise from the table not only satisfied but saturated. A new stimulus appears in the form of stewed beef, or *Côtelettes à la Suprême*: then comes a Bayonne or Westphalia ham, or a pickled tongue, or some analogous salted, but proportionably indigestible dish, and each of these enough for a single meal. But this is not all; game follows; and to this again succeed the sweets, and a quantity of cheese. The whole is crowned with a variety of flatulent fruits and indigestible nick-nacks, included under the name of desert, in which we must not forget to notice a mountain of sponge cake. Thus, then, it is, that the stomach is made to receive, not one full meal, but a succession of meals rapidly following each other, and vieing in their miscellaneous and pernicious nature with the ingredients of Macbeth's cauldron. Need the philosopher, then, any longer wonder at the increasing number and variety of dyspeptic complaints, with their long train of maladies, amongst the higher classes of society? “*Innumerales morbos non miraberis, coquos numera.*” King George III. dined at three o'clock, although the fashionables had got into the habit of dining at five. Now, the elite dine from six to nine!! Luncheon is dinner—dinner is supper.

with the mind ; secondly the brain ; thirdly the nerves ; fourthly the muscles ; the actions of which produce those motions which the mind had primarily determined. It is plain that there are two distinct functions exercised by the nerves : one conveying impressions from without inwards, and hence these are called nerves of sensation. The other, carrying the mandates of the will to the muscles, are, therefore, named nerves of motion. During our waking moments the brain and nerves are constantly engaged. Each organ must have its period of repose as well as that of action : even the heart is not an exception, for its several cavities are found to act and rest alternately. Now the length of repose of any organ should be determined chiefly by the duration and degree of its previous action. This is a law which applies generally to our organization. Take, for instance, the eye of a watchmaker, that by occupation is compelled to look attentively at minute objects for several hours daily ; secondly, observe the man who has laboured all day at manual employment ; thirdly, we find an individual living by the “sweat of his brain,” this organ worked by intensity of thought. It is plain that all three require an allowance of repose, commensurate to action, to recruit their respective systems by “nature’s soft nurse, balmy sleep.” He that lives by the sweat of his brow, has earned—compared with the other two—by his employment—so much in accordance with nature’s laws—a weariness that most sweetly invites to delicious repose. Again, there are some so indolent that, they have eyes and see not ; ears and hear not ; muscles and move not ; brain and think not—who, merely vegetate, live in the “laborious lassitude” of doing nothing. There is here no work, no exertion, consequently they may be said—not to require sleep, because they have not engaged either in corporeal or

mental exertion, still this unexcited state of the system predisposes to sleep. Some of this class—the gormandizers—do sleep, like apoplectics, or a boa constrictor after his enormous meal; but this is the brutish sleep of the glutton; (see p. 58;) for we have seen that when the stomach is loaded with food, there is a marked disposition for repose. (See p. 89). With them eating is the great business of life. They come—they go—

“ They eat, they drink, they sleep—what then ?

Why eat, and drink, and sleep again.”

The period allotted to sleep varies generally from six to eight or ten hours. It has been just now shown that the demand for repose ought to be proportionate to the corporeal and mental exercise of each individual. Bad consequences have been known to result from running into either extreme. From the principles already proved, it will appear that the necessary period of sleep will, more especially in the case of the dyspeptic, be inversely as the quantity of food taken. An invalid will often complain about the restless nights he spends as an excuse for morning sleeps—the latter are in all cases to be proscribed; the plan we would have him adopt is the following:—He should rise at the usual hour instead of courting morning slumbers, and he shall find that he will be desirous to seek his couch at an earlier hour the following night, and accordingly enjoy sound sleep. There is a popular feeling in favour of sleep before twelve o'clock, which we think is well founded. If the invalid will at one time retire to rest, say at twelve o'clock, and rise at eight o'clock, and at another go to bed at ten and rise at six, although in each case eight hours' rest shall have been obtained, yet, the result will be decidedly in favour of the latter. Two obvious salutary effects may be here mentioned, as consequent upon this plan,

namely, the avoidance of exhaustion, and the advantage of enjoying two hours of solar, instead of artificial light. The different effects produced on the human organism by the air of day and night are familiar to all. The invalid should carefully avoid reading deeply interesting books before bedtime, more especially tragedies and romances. But it is well known that vigilant individuals are often "read to sleep:" in this case, the subject should not be *popular* physiology, but some prosy work on political economy or a dull dry debate in parliament, in which some long-winded gentleman, for the sake of perspicuity and *brevity*, divides his speech into twenty-four heads. We have before mentioned, that excess of exercise produces a feverish condition, which of course indisposes us for sleep. Those agents that act as excitants upon the external senses, should be as much as possible withdrawn. We shall have, when on the sensitive functions, to consider the indisposition to sleep produced by an over-active brain and over-anxious mind. The bedroom should be one of the best and most airy apartments of the house, not crowded with furniture—and in despite of such nakedness the bedstead should be without curtains. If the valetudinarian be a beuedict (all men should be so) we will compromise the affair with his lady, and permit a light and airy suit of curtains in *winter*, which should be of a texture permeable by the atmosphere of the apartment. He should lie on a hair or alva mattress (either may be placed *over* a feather bed) and lightly covered. For those disposed to headache or fullness of habit the head and *shoulders* should be well raised; indeed the whole surface of the bed ought to form an inclined plane instead of a horizontal one. It is of great importance that those disposed to remain a-bed too long, shall not be tempted to indulge this habit by making them "snug," sunk in a downy bed "like a diamond in cotton." Some *say* they are very

desirous to rise early in the morning, but then they do not awake; and, if called, they fall fast asleep again, and quite forget that they had been called. Well, in the first place, let the valetudinarian *determine* upon rising without fail at a given hour; secondly, let him sleep with his shutters open and suffer the sun to rouse him;* lastly, if he will not rise when called, let him take something—suppose a key—that will be required in the morning, bolt his door, and direct the servant to knock until our bed-loving invalid shall start up and deliver the key. If he should go back to bed after this ingenious contrivance to dislodge him, his is a hopeless case of confirmed sloth. Some delicate individuals, as well as those in advanced life, will be benefited by a sleep of an hour or two after dinner; like the siesta of the warmer climates, it materially contributes to promote digestion. The celebrated John Hunter slept for an hour after dinner. It has been also stated that he slept but four hours out of the twenty-four, a practice we by no means recommend—even the healthiest—to follow. All tight garments should be loosed on such occasions, and the head and shoulders elevated, to counteract injurious determination of blood to the former, which might result from the ordinary horizontal posture.

Modifications.—Under this head we have to consider the influence exercised over the functions of digestion, by age, sex, temperament, climate, seasons, habit. We must be *now* very brief upon these subjects, which would afford—did time and space permit—interesting texts for observations of paramount physiological importance. We shall proceed to make some remarks upon each of them taken seriatim.

* The eyelids permit strong light to affect the eye, as may be proved by looking at the sun or a candle with the eyes closed. Moore, when describing a page reposing said, "His sleepy lids like snow on violets lay." A pretty poetical way of indicating *blue* eyes and *transparent* lids.

Age.—In infancy the breast milk of the mother or of a suitable nurse, we need scarcely add, is the most appropriate: when this cannot be procured, we have already (p. 145) mentioned that ass's milk is the best and cheapest substitute, in this case we can guard against dietetic errors on the part of the nurse, which we can by no means prevent in other instances. Nature, in the development of the teeth, affords us useful hints as to the changes in aliment that should take place in the progress from infancy to childhood. Our own experience would lead us to conclude, that there is more of mismanagement manifested in relation both to quantity and quality of food during childhood than at any other period of our existence. There is a popular knowledge respecting the injurious consequences caused by bad nursing; the delicacy of individuals during after life being not unjustly attributed to that circumstance. After the appearance of teeth—ass's milk, cows' milk diluted with barley water, thin gruel, and arrow root may be given in *small* quantity, and thus by increasing them by cautious degrees they may be wholly substituted for breast milk after the first year, *weaning* being thus gradually accomplished; after this period the nourishment may be somewhat of a solid character, and more nutritive—depending upon the temperament of the child—as panada, rusks, &c., and in some instances light animal broths, thickened with one or other of the foregoing farinaceous substances, will be admissable. The first set or milk teeth do not all appear until about two years; after this period we may venture, by slow degrees, to combine solid animal food with the farinaceous diet, but in this respect an error generally lies on the side both of the quality and quantity of the new aliment, the digestion of which requires to be aided by open air and exercise, and *no* schooling.

Well, the school-master is abroad with a vengeance. *Infant schools*, “to teach the young idea how to shoot,” may be a “delightful task” for preceptors *paid* for such avocations, but it is perfectly plain that this is an *unnatural* task—nay, preposterous in the extreme for the babe—to send the little innocent, playful gamboling thing, from its home—its mother’s apron string—to “discipline,” moral, intellectual, and physical, at such an age, and in such a place, crowded—heated—and often ill ventilated.

I showed, in a lecture published long since, the pernicious consequences resulting from this mania of the day: that often *exclusive attention* is devoted to the cultivation of the intellect of young people of both sexes at too *early* ages; thus bringing about a premature failure of minds, often naturally too precocious. I do not object to a fair proportion of cultivation of the nobler part of our nature at *all* times, but I seriously object at *an early period of life* to *intense* application to study, and to abstruse objects for consideration, owing to the necessarily injurious influence thus exercised on the complete development of both mind and body. It is a violation of common sense to put the boy to man’s labour—to demand the dwarf to raise the giant’s load. Too often have I seen the baleful consequences of confining children—mere children—during the greater part of the day, with a view to make their literary progress the admiration and the envy of their neighbours. “The most intelligent child that ever was seen—every man’s own child.” In such instances the health of children is often seriously undermined, before the parents or guardians take the alarm; some organic derangement, not unfrequently hydrocephalus, has now to be contended with, owing to the great excitement of the brain, and the medical practitioner is compelled, in many cases, to deliver a most unfavourable prognosis.

The philosopher may, at the moment, smile, and consider the time as mispent, which is occupied in the hopeless pursuit of a butterfly, or in urging the revolving hoop over the grassy plain. But he will, on mature reflection, say with the sage, there is a time for all things. He will exclaim, in the language of the Omniscient Disposer of all his works, the child should think and act as a child. Seemingly idle pursuits are but the dictates of nature; it is the age for physical, not mental development; for the wholesome exercise of the muscles, not for the injurious employment of the brain; the season for the accumulation of health, not for the dissemination of the baleful seeds of disease. Let us not suffer the scenes of youth, “when every sport can please,” to be embittered by irksome and unprofitable employment, and cultivation utterly unsuitable for such tender years.

Well, before and at puberty boys are so bold and headstrong that they will have air, exercise, and cheerful recreations; they earn an appetite for all kinds of food by such natural means, that staves dyspepsia quite out of countenance. Alas! the poor girls!—the boarding school ladies—that slowly march two and two with measured steps: they should “turn out” and determine, one and all, that they will not enter any establishment that is not out of the city, with airy dormitories, good garden affording a plot for each, (*her own*,) a *large* field to scamper about, skipping-ropes, shuttlecocks, &c. Let them but add to this, total abstinence from stays, and a new era occurs in female existence—in education moral and physical. Avaunt! dumb bells, back boards, reclining planes, *et hoc genus omne*. The offices of the doctors and apothecaries of such establishments, would—lamentable to relate—come under the denomination of sinecures; while the purveyors, vulgarly called butchers and bakers, would increase in an inverse ratio.

In adult age, the temperament of the individual will mainly influence the kind of diet to be employed. We shall presently turn to this subject.

In advanced life there is in general too much food consumed, and also of too stimulating a nature, which frequently acts as the predisposing or exciting cause of an apoplectic seizure. These individuals had acquired a habit of eating a certain quantity and kind of food; such aliment, while their habits were active and out-of-door, were then easy of digestion, but which now, under opposite circumstances, prove quite the reverse. The aged, when *unemployed*, are prone to think too much about eating and drinking—they are then often in a second childhood, and when edentulous, nature gives us a significant hint that milk and farinaceous food, as not requiring much mastication or powers of digestion, would prove most suitable.

Sex.—We find that males require, owing to their active and often laborious habits, a greater quantity of food than females, and also of a more nutritive character. We shall see hereafter that the original and innate temperament of the female differs widely from that of the male, and consequently the former requires, owing to that circumstance, a corresponding change in diet.

Temperaments.—We purpose considering this subject fully in its proper place. At present we shall offer such cursory observations on the influence which temperament should exercise over diet, as we think ought not be omitted. “A temperament may be defined a peculiar state of the system depending on the relation between its different capacities and functions, by which it acquires a tendency to certain actions.” Peculiar conditions of the mind, certain tastes, as they are called, are analogous to this physical distinction; and, indeed, we often have occasion to

acknowledge how much the peculiar development of the body is indicative of certain habits and dispositions of the mind. The names which Bostock applies to those temperaments, originally described by Hippocrates, we shall employ on the present occasion, as they are in common use, and well understood: they are the nervous, the sanguine, the tonic, the relaxed, and the muscular temperaments.

1. The *nervous* temperament, need we define it? It is like Loeke's simple idea—everybody knows that it depends upon undue susceptibility of the nervous system, more commonly superinduced than congenital. It is a sort of aristocratic constitution, consequent upon civilization, the refinements, the excitements of the higher walks of life—the offspring of the ball-room and the boudoir, as well as of the inevitable wear and tear of the system, which must be suffered when wealth, fame, and distinction are to be purchased by the “sweat of the brain” and the anxious throbbings of the heart. Richerand says, that Tronchin, a Genevise physician, acquired great wealth and reputation by the treatment of nervous affections. His whole secret consisted in exercising to fatigue women habitually inactive, keeping up their strength at the same time, by simple, healthy, and plentiful food. We have already furnished you with an anecdote (p. 254) in reference to the benefits to be derived from exercise; but, it should be discontinued the moment fatigue supervenes. Well, as to the dietary indicated above for this class, we have nothing more to add than that we would define “healthy food” for the nervous, to be that which will be nutritive without being stimulating.

2. *Sanguine* temperament.—This constitution is indicated by the predominant activity of the heart and blood-vessels, consequently we have a ruddy complexion and the countenance animated; and, indeed there is a marked dis-

position to enjoy the good things of the table as a characteristic feature in its development. Here we have an active, excitable, blood-making system, not prone to run into disease; but, such as occur are of the inflammatory kind, and hence, we should best consult the welfare of one of this temperament by enjoining a light form of diet, good proportion of farinaceous and vegetable food, and abstinence from fermented drinks and “alcoholic potations.”

3. *Tonic* temperament.—This has also been named *bilious*, owing to the marked superabundance of the biliary secretions. In such examples the skin will be of a brownish yellow tinge—hair black—muscles and veins well marked—character firm and inflexible. “As love is in the sanguine, so ambition is in the bilious—the governing passion.” Richerand adds, “Bold in the conception of a project, constant and indefatigable in its execution, it is among men of this temperament we find those who, in different ages, have governed the destinies of the world: full of courage, boldness, and activity, all have signalised themselves by great virtues or great crimes, and have been the terror or the admiration of the universe.” What a good illustration did his own emperor, Napoleon, afford of such a character, which he here so graphically describes, always ready with “head to plan and hand to execute.” Napoleon was not sufficiently attentive to regimen, which in his case (the bilious) should have been pretty nearly what we have mentioned as suitable for the sanguine temperament. Diseased condition of any of the abdominal organs, or derangement of the nervous system, often converts this temperament into what is called the *melancholic* or *atrabiliary*, the skin puts on a leaden hue—the imagination gloomy—the disposition suspicious—cancer is the disease of this habit—and of that malady Napoleon died. Clerc considers the last temperament less

as a primitive and natural constitution than as a diseased affection, hereditary or acquired. The state of mind and body of the exile of St. Helena, was well calculated to induce the deadly disease of which he died.

4. *Relaxed* temperament.—In this form the proportion of the fluids to the solids is too great—it is also called *pituitous* and *lymphatic*; there is bulk without firmness—countenance pale—deficiency of the vital powers—imperfect development of the functions—the memory treacherous—the attention not continuous. The individual of this habit is generally phlegmatic, slothful, and apathetic; one of those “fair and easy going people” that is never carried away by passion, feeling, or sympathy, because these are either languid, or altogether absent. Such are sedentary from choice. The diet suitable for this temperament should be nutritive and stimulating; animal food—wine—malt drinks and spicy condiments, &c. may be directed with advantage.

5. *Muscular* temperament is often originally *sanguine*, but when the individual applies himself to labour, the nutritive current is directed towards the working organs, and the former habit is then converted into “the muscular or athletic temperament conspicuous by all the outward signs of vigour and strength.” There is a lack of nervous energy—consequently “the perceptions are blunt, and deficient both in strength and accuracy. The state of the mind corresponds to that of the body; the feelings are not easily roused, but when the mind is once excited it obstinately retains the impression, and perseveres in its object with unshaken resolution.” The Farnese Hercules joined to his strength so little subtlety, that he was cheated by all the kings he served, and all the women he loved. A nutritive and chiefly animal diet will be suitable for such temperaments, although we find, as in the case of the Irish

peasantry, the most enduring efforts, while they are confined to a diet almost exclusively vegetable—the never ending potatoe.

6. The *mixed* temperament is one in which we observe the characteristic features of two or more of the preceding united like the blending of the prismatic colours.* How commonly do we find the bilious and nervous temperaments united. “The nervous man a man of nerve.” From what we have stated, it will be easy to determine the proportion of each which exists in any individual case, and adapt or modify the regimen according to the prevailing attributes and indications. It will be seen from the foregoing, how physical development may point out certain mental tendencies or peculiarities; and again, how certain employments and modes of thinking give a characteristic expression to the air, gait, and countenance of the individual. Hence, we speak of a countenance “mild, pale, penetrating,” or if of the dyspeptic cast, “pale, bilious, and interesting.” Need we add the common observation made on the *first* interview, the *prima facie* indications, which induce one to exclaim, “how intellectual,” “how cross,” “how good humoured” he looks—and all this without even a single glance at his phrenological development, *i. e.* with his hat on.

Climate has considerable influence upon man in reference to his appetite for different kinds of food and their digestibility. Nature, ever kind, supplies abundantly that species of food which is most suitable in relation to our wants and the quarter of the world in which we happen to

* The rainbow represents the effects of a prism, the light decomposed; but seven prismatic colours are observed, yet by the combination of these what an endless variety of tints and shades are produced as well as white, the result of *all*.

be located. The most striking contrast in this respect, is the difference in aliment provided for the inhabitants of the southern and northern quarters of the globe. How suitable are the products of the vegetable kingdom for the former, the delicious fruit, the perfumed air, the verdant landscape, the endless and enchanting notes of the feathered tribe! all prepare a refreshing banquet for the senses of the man, whose frame, subjected to the heat of the southern climate, would soon become exhausted but for these precious aids and antidotes that the bountiful Creator supplies. Let us now look at the inhabitant of the northern region—pent up by icebergs—nought meets his eye save sky and snow—his music is the blustering blast of rude Boreas. The vegetable world, locked up in iron bonds, affords no store tributary to his wants or gratifications. His country—one wild, bleak, icy prison; yet still it is preferred—nay loved—before the south with all its downy comforts, because her hardy son calls it the land of his birth and of liberty, in a word—Home. In this region the animal kingdom most appropriately affords a diet, at once nutritive, concentrated, and stimulating, to meet those wants which vegetable food could not adequately supply.

Seasons.—Here again we will find it necessary to profit by the indications given from the supplies afforded by nature during the different periods of the year; we should be also guided by the instinct that prompts the inhabitants of the cold and warm climates to select the most appropriate food: hence the proportion of animal food should be greater in winter and that of vegetable in summer. Ought it to be a matter of surprise, that those who live habitually inattentive to nature's laws, should be punished with dyspepsia? In some instances it becomes a stretch of recollection to remember when vegetables had been touched, if ever, when

lo! the dandy gentleman exclaims—" Yes, I once eat a —pea."

Habit.—Man has been justly said to be the creature of habit. No one of his functions is more influenced in this respect than that of digestion—appetite comes at the accustomed hour, if not satisfied it soon disappears—again, we change the period of meals, and after this custom has been persevered in for a short time we have a new habit formed, and come to look for food at hours of the day quite different from those of the first arrangement. One lives exclusively on vegetable food, another almost as exclusively on animal aliment, change of climate or some such contingency causes a necessity for a *vice versa* proceeding; the new custom is very soon followed by the contentment that springs from habit. I am quite certain that much mischief has been done to the valetudinarian by establishing a habit of almost constantly taking something in the shape of refreshment, which a morbid feeling, nearly allied to that of appetite, gives rise to. The regular periods pointed out (p. 302) should be resorted to as soon as possible. A habit which we are all prone to, is that of eating much more than is either requisite or salutary. The stomach becomes accustomed to undergo a certain degree of distention at given periods, the palate a given length of gratification, the nerves of the stomach and indeed those of the whole system a certain degree of stimulation; all these are regularly looked for—sought after, and become in time necessary for our comfort when the habit is confirmed. When considering condiments (p. 101) we referred to a judicious remark of Dr. Bostock, that such is the force of habit with reference to articles at first disagreeable to the palate, that they become those for which we afterwards acquire the strongest partiality; tobacco, garlic, and asafoetida afford remarkable illustrations of these circumstances.

Recapitulation, &c.—We have now drawn to the close of the tenth lecture, and to the conclusion of our observations upon the function of digestion—a subject which, owing to its importance, has necessarily made the greatest demand on our time and space. Before we conclude, I shall take a retrospective glance at the heads of the preceding lectures. In the introduction, we presume, strong proof was afforded of the importance that should be attached to a knowledge of Popular Physiology: that information which enables us to preserve a sound body and vigorous mind, and eschew quackery—the offspring of ignorance and credulity. We next proceeded to account for the limited extension of physiological knowledge amongst general readers; and, in conclusion, developed our plan, adopting as a motto “*utile dulei*.”

In the first lecture we introduced you to the vital principle and its properties, and gave you, in the witty and humorous review of the highly gifted Dr. Johnson, a graphic sketch of the wilds and labyrinths into which those *called* rational animals stray, when they stretch their tethers; and, consequently, substitute their insane imaginings for the results of rigid inductive inquiry.

In the second lecture we introduced you to the two great sections of the organised world—vegetables and animals; compared and classified each—showed the importance of comparative anatomy—adopted the classification of the functions of man, which Rieherand had pointed out; namely—those concerned in the preservation of the individual, and those for the continuation of the species: consequently, we next proceeded to consider digestion—the first process in the series of functions destined to effect the end—nutrition. We concluded with the consideration of hunger, thirst, and Irish Cavenagh.

In lecture three, we presented you with a brief account of cases of abstinence, voraciousness, and knife swallowing—an outline of the anatomy of the digestive organs—human and comparative; their functions—the qualities of gastric juice—important conclusions drawn by Magendie and Prout respecting alimentary substances—and finally, the consideration of the proximate principles and ultimate elements of all kinds of food.

In lecture four, we presented you with a condensed view of the relative digestibility of the different kinds of aliment according to the results of Beaumont's experiments on St. Martin, whose case afforded the most valuable opportunity on record, of inspecting the functions of the human stomach. Secondly, condiments and ardent spirits were considered; the baleful effects of the latter—physical and moral—were subsequently developed, and allusion made to the regenerating effects produced by the labours of that apostle of benevolence and teetotalism, the great and good Father Mathew.

In the fifth lecture, chymification—the second stage of digestion—was considered, and the important agency of the liver in this process was fully explained; as well as the influence which bile is known to exercise on the functions of the remaining portion of the digestive tube. The reciprocal influence of body and mind was then explained—the plan of spending the day was next detailed. Finally, breakfast, and the fluid aliments usually taken at that repast, were considered; namely—tea, coffee, chocolate, cocoa, milk, whey, barley-water, gruel, &c.

In the sixth lecture, the solid material of breakfast was discussed—moral therapeutics, or the influence of mind over the different organs was considered with relation to each, taken separately.

In the seventh lecture this subject was concluded. Observations were next made respecting butter, honey, fish, and meat. Having concluded the subject of breakfast, we sought to consider how the individual we had selected ought to dispose of his time between breakfast and dinner—this became the more necessary, as we had previously proved that the function of digestion was, at all times, materially influenced by the nature of man's avocations.

We selected the medical man as *dramatis persona*, to exemplify the inevitable wear and tear of human life, belonging to all its departments—perhaps more especially to him; but we conceive that those practical hints, which we have there afforded, may be readily referred to each one of the public in his individual character:—*Mutato nomine de te fabula narratur*; or, as Nathan said to David, “Then art the man.”

In the eighth lecture we continued the sketch, selecting the late Cheyne as an illustration of the wear and tear consequent upon unceasing toil, mental labour, and corroding anxiety, while in the pursuit of fame and wealth. The characters of the English, Scotch, and Irish are contrasted.

In the ninth lecture we cited the examples of Dupuytreu and Richerand abroad, to show that there, as well as at home, the power of mastering the mind was not possessed by the most distinguished sons of science, and that human nature is immutable, in every age, in every clime; alike the victim of ambition, envy, and uncontrolled mind. We next alluded to the admirable work of Abercrombie on mental culture; and the true panacea proposed by him, which we quoted at length in his own forcible and eloquent language.

Having dismissed the subject of every day business, we finally came to concentrate our observations upon the con-

cerns of the valetudinarian; which, in the present as well as the last lecture, have occupied our attention under the following heads:—exercise and air; enjoyments; articles of food; period of meals; sleep; modifications; contingencies, &c. The observations made on each of the foregoing are all so fresh in your recollection as not to need any further remark at present, except this general one, that each of these departments requires to receive its due share of consideration, for if otherwise, that complete equipoise of the respective functions cannot be expected which is essential to the enjoyment of the *mens sana in corpore sano*.

A WORD IN CONCLUSION RESPECTING THE FIRST PART.

“Once upon a time—and a very good time it was—days of my youth when every sport could please”—a student of alma mater, Trinity College, Dublin, whose propensities turned more upon thrashing the Charleys (*olim* watch) than upon the cultivation of the muses, replied thus to the enquiry of his friend; my examiners and I are not on speaking terms, consequently, I will be “*cautioned*.”

Now we have always ardently admired the following aphorism, which is here quaintly rendered into English by old Lily:

“*Felix quem faciunt aliena pericula cautem:*

Happy is he whom other men's harms do make to beware.”

Accordingly, we started with the conviction, that to keep on “speaking terms”—*i. e.* *intelligible* terms—with the public, we should eschew the jargon of the schools—in other words—deseend from the dignity and gravity which proverbially belong to our profession; and communicate what we had to say in plain Queen’s English; in a familiar and light style, what, perhaps, some of our friends may esteem too light.

We have also ever evinced a becoming horror of a “*caution*,” more especially of that given by the public, when they consign—as it deserves—a dull, difficult-to-be-understood, *unreadable* book, “to the grave of all the capulets.”

A common error a professional man falls into—which we have endeavoured to avoid—is the conception that his hearer is, by a sort of intuitive knowledge, familiar with the terms and technicalities of his calling. If the unfortunate listener be engaged in a Chancery suit, “the limb of the law,” in “*de lunatico inquirendo*,” bewilders him with this, in the “*matter*,” that, in “the *cause* ;” the ill-fated client being all the while perfectly innocent of what constitutes the difference between one and the other.

So much for the manner—the “*fashion*” of our lectures ; now for the matter—*not de lunatico*. We have shown in the course of the preceding discourses what Beaumont had proved, “that *bulk* as well as *nutriment* is *necessary* to the articles of diet ;” and again, “that the digestibility of aliment does not depend upon the quantity of nutrient principles it contains.” Acting in conformity with the first principle, we never think of feeding either man or horse upon all meat (flesh) or all oats : and, in compliance with the second rule, we would not disorder a man’s digestion by giving him *all* fat, instead of both fat and lean ; although, the former is found to be four times as nutritive as the latter. “Feed me with food convenient for me” is alike applicable to mental and to physical supply—mischief invariably results from a too-concentrated diet.

.....“The prudent taste
Rejects like bane, such loathsome lusciousness.”

Well, then, the public are, at best, but babes in relation to physiological knowledge ; and should, consequently, be supplied with light and agreeable food—“*utile dulci*.”

Although “there is nothing new under the sun,” we do lay claim to something of originality, not so much perhaps in the arrangement of the materials, as in giving expression—unreserved expression—to reflections somewhat novel, that arose out of the foregoing process. It is not for us to deplore, with nauseating mock modesty, our sins of omission and commission. Each successive wrapper of the six numbers, has exhibited a mantle of kindness thrown over our labours and errors—such as they are—by an indulgent Press. We are also proud to add, that we have not had any lack of support from a *discriminating* public, as well as our highly valued and esteemed friends, to all of whom we now most respectfully and gratefully tender our best acknowledgments; and, as in duty bound, will soon have the honor of presenting them with the second part.

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